

33657/B

To
The Honourable
George Hanbury
of
Coalbrook in the County
of Monmouth Esq.

This Book
most Humbly presented
by the Author.



J. S. Miller Del. et Sc.

*Hail sacred Springs! of future Bards the Themes!
When known the Virtues of your healing Streams.*

A
T R E A T I S E
On the T H R E E
Medicinal MINERAL WATERS
A T
L L A N D R I N D O D,
I N
Radnorshire, SOUTH WALES.
W I T H S O M E
R E M A R K S
O N
Mineral and Fossil Mixtures,
I N T H E I R
Native V E I N S and B E D S ;
At least as far as respects
Their I N F L U E N C E on W A T E R.

By D I E D E R I C K W E S S E L L I N D E N, M. D.

Multum diuque Desideratum.

L O N D O N :

Printed by J. EVERINGHAM and T. REYNOLDS,
for the AUTHOR :

And Sold by W. OWEN, at *Homer's Head*, Tem-
ple Bar, 1756.





T H E
P R E F A C E.



SHALL not go about to bespeak the Reader's favourable Acceptance of the following Sheets, by assuring him of the Disinterestedness of my Motives ; nor intreat his Pardon for their Publication, by alledging, in my Excuse, the Sollicitation of Friends, or any other popular Apology ; which, however seriously and gravely urged, is, I fear, but very seldom believed ; most Readers being apt to judge, from the common Nature of Mankind, that Authors of every Class, and in every

My Acquaintance with the *Llan-drindod* Waters is of no longer Date than *August* 1754; when I went thither, invited by their Fame, in order to reap the Benefits of those good Qualities and medicinal Virtues, with which Report had so liberally, and (as I have since found by Experience) so deservedly furnish'd them. I was at that Time afflicted with an inveterate Scurvy; which had for several Years soured my Juices, and irritated them on every trifling Occasion. I had likewise been injured, in some Degree, by noxious mineral Damps, contracted by analyzing Minerals; which, by virtue of the Remedies I had made use of, were propelled to the Extremities; and the Complaint had fallen into my Hands; where it broke out, and ulcerated in a very troublesome and painful Degree. In this Condition I came
to

Llandrindod Wells, to seek that Relief I was informed others had there obtained in the like Cafes.

AT my Arrival, 'tis natural enough to suppose, I should first attempt a previous Examen of the Waters ; and as there are three Sorts, each excellent in its Kind, to fix upon that which seemed to be best adapted to my particular Disorder. The Result of this Scrutiny was, that I chose the saline Pump-water for my Remedy. I drank it not quite four Weeks ; when, I thank God, I found my Disorder cured, to my own unspeakable Comfort, and the great Surprize of all my Friends and Acquaintance.

DURING my Stay at the Wells, I had the Pleasure likewise of seeing their good Effects on several others ; particularly on one Patient, labouring under a total Weakness proceeding from
a Va-

a Variety of Disorders; who, by the Use of the *Rock-Water*, recovered to an amazing Degree of Strength and Vigour. Another scorbutic Patient I had the Pleasure to see recover from an inveterate and tedious Distemper to a surprizing Degree of Health, by drinking the *Saline Pump-Water* for about the same Space of Time as I drank it myself. A third, who had long been violently afflicted with an Arthritic Disorder, that had taken its Seat in the Stomach, was perfectly relieved by the Use of the *Stinking* or *Sulphur-Water*.

IT was not my Design, in this Preface, to enumerate particular Instances of this Kind; though I could do it with great Integrity and Regard to Truth; were it not that I am forbid by some Considerations and Circumstances, with which there is no Necessity

fity

sity of troubling the Reader. Much less is it my Intention to enter upon a formal tedious Defence of every Thing asserted in the following Sheets. I shall only desire the Reader, before he passes Censure on any particular Point of Doctrine contained in them, to enter as far as he can into the Principles from which it is deduced, and the Nature of the Experiments on which it is founded : In order to this, some general Knowledge and Insight into natural Philosophy, some slight superficial Acquaintance, at least, with Chemistry and Physic, will, I believe, be presumed requisite. Without these, the greatest Geniuses will prove but very incompetent Judges of Works of this Kind. Observations of no Consequence will to such appear important, only because they are elegantly or pompously expressed. As, on the
other

other hand, Things of great Utility will be condemned as low and trifling, for no other Reason, than that they are obvious and simple. Critics of this Stamp will think it frivolous, if not worthy of Ridicule, to be told, That the best Time to drink medical Waters is before the Sun is too high ; that the Rock-Water of *Llandrindod* is an excellent Remedy on the Spot, and but an indifferent one at 10 or 12 Yards Distance ; or that the Goodness of the *Welsh* Ale is one Evidence to prove the Wholsomeness of the Air of the Country. These and the like Observations will, no doubt, be censured as frivolous insignificant *Minutiæ*, by Readers unacquainted with the physical Causes of Things. For it is an affecting Remark, but verified by daily Experience, that we often see the greatest Lights, and brightest Ornaments
of

of Literature unhappily stranded, and suffering shameful Shipwreck on the plain, simple, and unerring Rules of Nature.

I SHALL, however, beg Leave to obviate here one Objection, which I am persuaded many of my Readers will naturally make, to those Passages where I assert, that both the Coal-damps under Ground, and the Vapours arising from Coal-fires above Ground, are not only harmless but salutary. How (say they) is it possible that this can be true; when it is manifest that many Persons have been suffocated, and miserably lost their Lives both by the Damps and Vapours? I am far from denying the Facts on which this Objection is grounded; as having myself, more than once, seen Miners fall unhappy Victims to these kinds of Damps, not only in Coal-

b

pits,

pits, but in other Mines. Nor is it very hard to conceive, how in a close Room, with a sufficient Quantity of Coal-vapour confined in it, the strongest Man on Earth may be suffocated. All this I very readily grant ; yet cannot see how the Objection founded on it can overthrow, or even invalidate what I have advanced with regard to the Wholsomeness of these Vapours. The evil Effects objected proceed from the Excess, and not the Quality of the Thing under Consideration. And indeed this Objection will bear equally hard on every Thing we can possibly meddle with in Life. A Man may be drowned in the most fragrant and generous Wine, as certainly as in a Quantity of the foulest Water. In a Word, every Thing ordained for the Support and Comfort of Life, may be abused into Mischief and Poison, according to that trite Maxim of the Poet.

Nil

*Nil prodest, quod non lædere possit
idem.*

IT is then the Abundance or Abuse of the Coal-vapour that is noxious to Health, and not the Medium ; which I am persuaded is, in many Cases, highly salutary. This salutary Medium Providence has kindly pointed out to us in the *Llandrindod*-Waters ; where it is so much interwoven with Bars of Stones, and Strainers to filtrate it through ; that we cannot but behold it with the greatest Amazement and Veneration.

THERE is a deadly Poison in the Fermentation of Wine and Beer, which is actually a real Offspring of the Liquor itself. Of this as I have found little or no Notice taken, I shall present the Reader with an experimental

Account of it ; so as to convince those who object to the Wholsomness of the Coal-damps, that they have a more virulent Quality much nearer them, than that they suspect to be lodged in Coal. The Poison I here mean is that *Æther* produced in Fermentation. *Helmontius* calls it *Gas Sylvestre*. Few Chemists have ever attempted to demonstrate it corporally ; but they have contented themselves to form a Judgment of it from its Effects. It is a kind of Vapour or Exhalation that arises in the Fermentation ; and if the Cellar, or Place where the Fermentation is perform'd, be kept so close that nothing can exhale, it will infect the whole Atmosphere of the Place to that Degree, that no Candle can burn in it ; nor can any Animal retain its Life, but dies instantaneously on the Spot. Upon which Account
Brewers

Brewers always contrive Openings in their Fermenting-cellars, thro' which this noxious Vapour may exhale.

I HAVE already remark'd, that few Chemists have attempted to demonstrate corporally what this Vapour is. But the Alchymists, who maintain that their Mercury is in the vegetable and animal Kingdoms, as well as in the mineral, affirm that this very Vapour is their Mercury. I confess, the rational Chemist cannot well deny this Assertion of the Alchymists ; because late Experiments have proved beyond Contradiction, that these Vapours are arsenical ; and that the same may be produced out of Vegetables and Animals : And the late Improvements in Metallurgy have made it appear, that Arsenic is certainly the *Mercurius Metallorum*. It will be very happy

py

py for the Smelters in *Wales*, when they come to be intimately acquainted with this Truth ; as it will be of great Service to them, in order to improve their Method of Smelting upon this natural Principle.

Now no one will infer from the foregoing Account, that the Steams and Vapours of Wine or Malt Liquors are, in every Degree, pernicious to the human Body, because an extraordinary Quantity of them, when closely confined, is pestiferous and deadly. If that were the Case, no one would venture to drink the Liquors ; or so much as enter into a Brew-house, or Wine-cellar. In all these Instances it is Excess alone that is to be dreaded ; and the Quantity not the Quality is the Cause of the Mischief : And the same Way of Reasoning

soning will hold equally good with respect to the salutary or evil Effects of the Damps and Vapours emitted from Coal.

LEST the Experiments, described in the Third Book, should not appear sufficient to prove the real Existence of perfect Sulphur in the *Llandrindod* Sulphur-Water ; I shall endeavour to remove every Scruple of that Kind, by mentioning here one Experiment, with which I shall conclude this Preface.

LET the doubting Person take some of the black Precipitate of that Water ; and when it is gradually dried, let him add to two Ounces of this Precipitate one Dram of powder'd Arsenic ; mix it well ; put it into a small Retort, and sublimate it : He will then find a red Arsenic in the Neck
of

of the Retort ; which could not exist, unless there was a perfect Sulphur in the Precipitate or Sediment of the Water, that was mixed with the Arsenic.





T H E
C O N T E N T S.

The INTRODUCTION.

CONTAINS a summary Description of
LLANDRINDOD; its Situation, Air, Soil
and Productions; together with some short
Account of the Wells, public Rooms, and Com-
pany that Resort to them. Page i

c

BOOK

BOOK I.

An Experimental Dissertation on the Saline Chalybeate Water of Llandrindod, commonly called the Rock-Water: Wherein its Qualities are considered and explained, its Efficacy in Distempers described; and proper Directions given for its medical Use.

CHAP. I.

<i>The Rock-Water experimentally considered</i>	Page 9
Hoffman's Account of mineral Spirit	33
<i>A Letter from the Author to a Nobleman, concerning the Chevron or Bru Waters; from the Gentleman's Magazine for December, 1751</i>	36
<i>The Contents of the Rock-Water.</i>	42

CHAP. II.

<i>Of the innate Qualities of the Rock-Water of Llandrindod, and its Efficacy in several Distempers</i>	43
<i>In</i>	

<i>In Chronical Disorders, that proceed from a Laxity or a Weakness in the Fibres; and Ob- structions consequent thereon</i>	Page 60
<i>In Scorbutic Eruptions, that proceed from a Plenitude of the Serum, or watery Part of the Blood</i>	74
<i>In weak Nerves</i>	78
<i>In Palsies, that are caused by a general Resolu- tion or Laxity of the whole Frame</i>	80
<i>In Agues, where the Bark proves ineffectual</i>	82
<i>In Disorders of Women; such as are incident to them from an undue Regulation of their monthly Courses</i>	84
<i>In seminal Weakness in both Sexes</i>	94
<i>In what Diseases or Constitutions this Water is not to be used.</i>	95

C H A P. III.

<i>Proper Directions for the medical Use of the Rock-Water at Llandrindod</i>	96
<i>1. Of the necessary Preparations, which ought to precede a Course of Drinking the Rock- Water</i>	100

2. *In what Manner we ought to enter upon the Course ; and under what Regulations and Restrictions* Page 107
- The Quantity to be taken each Day* 109
- It does not operate by its specific Gravity* 112
3. *How to proceed on any Revolution, or accidental Disorder, that may happen while under the Course* 122
4. *What Management is requisite after the Course is completed.* 129
5. *What Regard is to be paid to After-effects, or Consequences, which sometimes ensue in Process of Time. And what Regulations are to be observed therein.* 131

B O O K II.

Contains the Experiments of the Saline Purging, vulgarly called the Pump-water at Llandrindod. Its natural Existence and causa originis are philosophically considered. From which, as well as from received Experience, its Qualities and Virtues are deduced and concluded; and necessary Directions are given in what Manner to use it beneficially in several Disorders.

C H A P. I.

<i>Contains Experiments of the Saline Purging, vulgarly called the Pump-Water</i>	Pag. 134
<i>The Doctrine of Salts</i>	146
<i>The Virtues of the Oil contained in this Water</i>	157
<i>The Contents of the Pump-Water.</i>	165

CHAP. II.

The Nature, Existence, and original Cause of the Saline Pump-Water of Llandrindod is philosophically considered. On which its Qualities and Virtues, in the several Diseases incident to human Nature, are established and concluded Page 166

The Origin of its Salt 176

The mineral Waters of Sedlitz in Bohemia discovered and examined by Hoffman 181

The Pump-Water of Llandrindod will be found an excellent Remedy for

1. *The Scurvy* 191
 Ulcers or Herpes 193
2. *The Hypochondriac Malady* 194
3. *The Morpheæ* 195
4. *In Fevers* 196
5. *In the Leprosy* 197
 The Scrofula or King's Evil ibid.
6. *Impure and heterogeneous Juices* 198
7. *In the Gravel.* 200

C H A P. III.

<i>Directions for using the Saline Pump-Water at Llandrindod</i>	Page 202
1. <i>What general Evacuations are to be preparatively used</i>	207
2. <i>What Method is to be pursued in the Course</i>	209
<i>The Quantity of the Dose</i>	210
<i>How to proceed in the Scurvy</i>	211
<i>For Tetters and Boils</i>	212
<i>In Hypochondriacal Affections</i>	213
<i>The Morpew</i>	215
<i>In Fevers</i>	216
<i>In the Leprosy, Impurities of the Blood and Juices ; and in the Gravel</i>	218
3. <i>What Regimen or Diet is to be observed during the Course</i>	219
4. <i>Some necessary Regulations and Considerations concerning the Distempers and Revolutions that may possibly arise, during the Course of drinking these Waters</i>	221
5. <i>What Management is requisite after the Course</i>	225

6. *Some Effects that remain after the Use of this Water* Page 227
7. *What Subjects ought to bathe in this Saline Water only* 228
8. *How to guard against bad Consequents attending Baths; and some Rules necessary to be o^bserved after Bathing* 234
-

B O O K III.

Contains a physical and historical Account of the Sulphur-Water at Llandrindod, and Experiments on which the Contents of it are established; describes the Distempers in which it is salutary; and lays down Directions and Rules for Drinking, Bathing, and all other its medicinal Uses.

C H A P. I.

<i>A Physical and Historical Account of the Llandrindod Sulphur-Water</i>	Page 237
<i>Pit-Coal not generated from Wood, as some French Naturalists conjecture</i>	243
<i>Sulphur-Water good to kill Worms</i>	248
<i>How and when these Springs of Sulphur-Water were discovered at Llandrindod</i>	251
<i>Of mineral Ferments.</i>	256

C H A P. II.

Contains the Experiments from which the Contents of the Llandrindod Sulphur-Water are ascertained; and an Enumeration of the Distempers in which it is likely to prove salutary Page 259

Dr. Bond's Account of a remarkable Spring, issuing from a Copper Mine in Ireland; that seemed to change Iron into Copper 269

The Contents of the Sulphur-Water at Llandrindod 272

Dr. Hoffman's rational Account of the manner wherein warm Bathing acts 275

In what Distempers Bathing is salutary. 278

C H A P. III.

Contains Directions for Drinking, Bathing, and all other medical Uses of the Llandrindod Sulphur-Water. 285

The Manner of making a Slag-Bath 286

1. How to make an artificial Bath: And how to guard against the ill Consequences, which sometimes ensue upon Bathing 289

The Steam-Bath 292

The Stillicidium, or Dropping Bath 293

2. How

2. <i>How to use a Bath made with this Water</i>	Page 296
3. <i>The Manner of Fomenting with this Water</i>	300
4. <i>How to cleanse and wash old Sores and Tetters with this Water : And how to dress them with the black slimy Precipitate</i>	301
5. <i>In what Manner this Water must be drank in Conjunction with Bathing</i>	302
6. <i>How it must be taken when Bathing is omitted</i>	303
<i>The Quantity of the Dose.</i>	305

P O S T S C R I P T.

<i>Of the Benefit, that might be received by Persons afflicted with INTERMITTING FEVERS, from the Use of the Saline Pump-Water of Llandrindod, or its Salts, when exported. -</i>	
<i>Of the right Use of Purgatives, or other Evacuants, in the Cure of FEVERS</i>	307
<i>The Salts of the Llandrindod-Waters exceed those of Sedlitz.</i>	310

APPENDIX,

- Containing a short and summary Account of several other Springs of mineral Waters in Wales. To which are added some Considerations on the Utility of chemical Knowledge in the Practice of Physic; and several Arguments offered in Defence of the Author's Assertion, That heavy Medicines do not operate in the human Body by their natural Weight or specific Gravity* Page 315
- Wales very much like Switzerland* 316
- A Spring of mineral Water at Troesellyne Hill, sometimes called Paris Mountain, in the Estate of Sir Nicholas Bayly, Bart. Knight of the Shire for Anglesea* 317
- Another, in the Bishop of Bangor's Garden in Carnarvonshire, in the Town of Bangor, just by his Lordship's Palace* 318
- And another, about half a Mile to the East of Bangor, at Aber Keggen, in General Warburton's Estate* ibid.
- Another in the same County, at Treferiw, within two Miles of Llanrwst* ibid
- Another, within a Mile of Llanrwst, in Denbighshire, in the Estate of Thomas Kyffin, of Maynan, Esq;* 319
- Another,*

<i>Another, call'd St. Peter's Well, near Ruthyn, surrounded by the Lands of Richard Middleton, Esq; of Chirk-Castle, Member of Par- liament</i>	Page 321
<i>The Utility of Chemical Knowledge in the Prac- tice of Physic</i>	324
<i>That heavy Medicines do not operate in the hu- man Body by their natural Weight or specific Gravity</i>	330
<i>Proved</i> 1. <i>From Mercury in a Salivation</i>	331
2. <i>From Drunkenness</i>	332
3. <i>From the Manner in which our daily Food operates</i>	ibid.
4. <i>From drinking cold Water</i>	333
5. <i>From Anatomical Observations</i>	ibid.
6. <i>From mercurial Unctions; and from Dr. Dover's Method of taking Quicksilver.</i>	334

ERRATA.

- Page 1. line 7. for *Rayndor* read *Rayador*.
line 11. for *Knighton* read *Kington*.
Page 2. line 25. for *Coutre* read *Cantre*.
line 26. for *Hampton* read *Harpton*.
Page 12. line 6. for *Principle* read *Crucible*.
Page 140. line 12. read, *so much as not to interrupt, &c.*
Page 155. line 7. for *prima via* read *primæ viæ*.
Page 170. line 3. for *Abestos*, read *Asbestos*.
Page 171. line 16. for *Therma*, read *Thermæ*.
Page 241. line 19. for *Rock-Water*, read *Rock-Salt*.
Page 268. line 23. for *thence*, read *London*.
Page 319. line 15. read *Thomas Kyffin of Maynan, Esq;*



A

L I S T

Of the NAMES of such

S U B S C R I B E R S

As are come to Hand.

HER ROYAL HIGHNESS THE PRINCESS
DOWAGER OF WALES.

A.

HIS Grace the Duke of Ancaſter.
Her Grace the Dutcheſs of Ancaſter.
Mr. Francis Anneſley, of Curſitors Street.
Edward Aſhe, Eſq;
Mr. Edward Atkinſon.

The

B.

The Right Reverend Zachary, Lord Bishop
of Bangor.

The Right Honourable Lord Brownlow Bertie.
Sir Nicholas Bayly, Baronet, Knight of the
Shire for Anglesea.

My Lady Bayly.

G. Baker, M. D. at Stamford.

Mr. Thomas Barber.

Hugh Barlow, of Lanrenny, Esq; Member
of Parliament.

Mr. James Bafire, Engraver.

Miss Mary Batchelor, 2 Books.

Mr. William Bell, Supervisor of the Excise
at Denbigh.

Michael Biddulph, junior, of Lincolns Inn,
Esquire.

The Reverend Mr. Bland, Chaplain to his Grace
the Duke of Ancafter.

Mr. Thomas Bowen, of the Royal Exchange.

Mr. Thomas Bradbury, Apothecary, in South-
ampton Buildings.

Mr. Frederick Brandenburgh, Chemist, in
Piccadilly.

Mr. William Bridges, of Conway Furnace.

James Briscoe, Esq; Collector of the Customs
in Beaumaris.

Mr.

Mr. — Brogdan, Surgeon, in Thrift Street,
Soho.

William Brynker, of Brynker, Esq;

Samuel Bulkeley, of Coedana, Esq;

Mrs. Elizabeth Burney.

C.

John Campbel, of Red Lion Street, Esq;

Mr. Edmund Chapman.

Mr. Michael Clarke, of Presteign, Radnorshire.

Mr. Bartholomew Cock, of Brecon, 2 Books.

Mr. John Cook.

Stephen Comyns, of Lincolns Inn, Esq;

D.

Albert Davies, of Carmarthen, Esq;

The Reverend Mr. Hugh Davies, of St. Asaph,
Clerk.

The Reverend Mr. Price Davis, Clerk, Usher
of Denbigh.

Mr. Thomas Davis, of St. Alban's Street,
Mineral Water Purveyor to his Majesty,
the Prince of Wales, and the rest of the
Royal Family.

E.

The Right Honourable the Earl of Egmont.

D

The

The Rev. Edward Edwards, A. M. of Jesus College, Oxon, Lecturer of Lanrwst.

Mrs. Mary Edwards.

Richard Edwards, of Lincoln's Inn Fields, Esq; one of the Masters in Chancery.

Thomas Edwards, Esq; of Cardiff, in Glamorganshire.

Walter Edwards, Esq; of Great Ruffel Street.

Francis Elde, Esq; one of the Masters of the High Court of Chancery.

— Ellis, of Kyffty, Gent. Attorney at Law.

The Rev. John Ellis, L. L. B. Archdeacon of Merioneth.

Mr. Evan Evans, Apothecary at Denbigh.

John Evans, of Llwynbaried, Esq;

Owen Evans, of Pennant, in Brecknockshire, Esq;

The Rev. Robert Evans, Rector of Heneglwys, Anglesey.

Mr. Thomas Evans, of Long Acre.

The Rev. Mr. William Evans.

Mr. John Everingham, Printer, in Dean Street, Fetter Lane.

F.

Mr. Richard Fiddes, Purveyor of Mineral Waters, Tavistock Street, Covent Garden.

William Fitz Herbert, Esq; of Thiffington, in Derbyshire.

William Fordyce, Esq; Surgeon to the third Regiment of Foot Guards

Mrs. Anne Foulks, of Landbeder, near Ruthin.

G.

John Garnons, Gent. Deputy Prothonotary of North Wales.

Mr. George Geary, Postmaster of Denbigh.

Mrs. Goff, of Ford, in Shropshire.

Mr. Charles Gosnell, of Preston, in Lancashire.

The Rev. Mr. Green, Rector of Llanbuden, near Ruthin.

Cristopher Griffith, of Lincolns Inn, Esq;

Griffith Griffith, of Methlem, Esq;

John Griffith, of Beaumaris, Esq;

John Griffith, of Garne, in Denbighshire, Esq;

John Grubbe, of Cook's Court, Esq;

Howel Gwynne, of Garth, Esq; Knight of the Shire for Radnor, 4 Books.

Marmaduke Gwynne, junior, Esq; 4 Books.

Marmaduke Gwynne, of Brecon, Esq;

H.

The Rev. Stephen Hales, D. D. Clerk of
the Closet to her Royal Highness the Prin-
cess of Wales.

Henry Hall, of Curfitor's Street, Esq;

Robert Harpur, of Lincoln's Inn, Esq;

Joseph Hart, of Gough's Square, near Fleet
Street, Gent. Teacher of the Learned
Languages.

John Hensleigh, of Panteague, Esq;

John Hervey, Esq; of Lincolns Inn, Member
of Parliament, and one of his Majesty's
Justices for the Counties of Glamorgan,
Brecon, and Radnor.

Mr. John Holdstoke, 2 Books.

Jeffery Holland, of Pennant, Esq;

Rogers Holland, Esq; his Majesty's Justice of
the Great Sessions of Carnarvon, Merioneth,
and Anglesey, North Wales.

Mr. William Holland, of Lincoln's Inn.

John Hope, of Lincoln's Inn, Esq;

Mr. John Horrocks.

The Rev. Mr. David Hughes, Clerk, Rector
of Llanddoget.

John Hughes, of Hendreveller, in Cardigan-
shire, Esq; The

The Rev. Mr. Lewis Hughes, Minister of
Berkley Square-Chapel.

Owen Hughes, of Beaumaris, Gent. Attor-
ney at Law.

Richard Hughes, of Bodrwin, Esq;

The Rev. Tho. Hughes, L. L. B. School-
master of Ruthin, and Rector of Llan-
fwrog.

Gabriel Humphreys, of Henblas, Gent. At-
torney at Law.

John Humphreys, of Ruthin, Gent. Attorney
at Law.

Mr. John Hyde, Apothecary at Bourne, in
Lincolnshire.

I.

Sir William Irby, Baronet, Chamberlain to
her Royal Highness the Princess of Wales.

Thomas James, of Brecon, Esq; 2 Books.

Mr. Richard Jeffries.

Dr. Jennings, two Books.

The Rev. Mr. ——— Jones.

Abel Jones, Esq; Alderman of Ruthin.

John Jones, of Denbigh, Gent. Attorney at
Law.

Mr. John Jones, of Long Acre.

The Rev. Mr. Middleton Jones, of Middle-
wich, Cheshire.

xxxviii *A List of* SUBSCRIBERS.

Peter Jones, Gent. Attorney at Law, Recorder of Ruthin.

Robert Jones, A. B. Fellow of St. John's College, Cambridge.

The Rev. Thomas Jones, A. M. Rector of Llandderfel.

Thomas Jones, Esq; of Penkerrig, in Radnorshire.

William Jones, Esq; of Plas Gwynne, in Anglesey.

Mrs. Jones, of ditto.

Miss Jones, of ditto.

K.

Mr. George Keith, Bookseller in London.

Miss Anne Kelly.

Mr. John Kelly.

Tho. Kyffin, of Maynan, Esq;

Mrs. Kyffin,

Master Kyffin,

Miss Kyffin,

Mr. John Kyffin,

} of ditto.

Thomas Kymer, Esq; of Robison, in Pembrokeshire.

L.

Mr. John Leche, of the Office of Pleas, in Lincoln's Inn.

Ambrose Lewis, of Beaumaris, Gent. Attorney at Law. Mrs.

Mrs. Elizabeth Lewis, of Llanfihengel Tre'r
beirdd, Anglesey.

Mrs. Hannah Lewis, of Welch Pool.

John Lewis, of Llanfaglan, Gent.

John Lewis, of Pwllheli, Gent, Attorney at
Law.

Thomas Lewis, of Harpton, Esq; Member
of Parliament.

Thomas Lewis, of Nantwyllt, Esq;

David Lloyd, of Gwrych, Esq;

Mr. Robert Lloyd, of Llanddogat.

Robert Lloyd, of Tregauan, Esq;

William Lloyd, of Bedford-Row, Esq;

John Lockman, Esq; Secretary to the Herring
Fishery.

The Rev. Richard Longford, B. D. Fellow
of Jesus College, Oxon.

Charles Lucas, M. D.

M.

John Madocks, of the Middle Temple, Lon-
don, Esq;

Sparks Martin, Esq;

The Rev. Peter Maurice, A. M. Rector of
Llanllechid.

Mr. Evan Meredith, of Presteign, Radnorshire.

Mr. Husband Messiter, Surgeon, in Great
Pultney Street.

xl *A List of* SUBSCRIBERS.

Lewis Meyrick, Gent. Marshal and Register of the Great Session of Carnarvon, Merioneth, and Anglesey.

Mr. John Moors, of Stamford.

Henry Morgan, Esq;

Hugh Morgan, Esq; of Bettus, Radnorshire.

The Rev. William Morgan, A. M.

Richard Myddleton, of Chirk-Castle, Esq;
Member of Parliament, 2 Books.

Miss Anne Myddleton.

O.

Sir William Owen, Baronet, Member of Parliament for Pembrokeeshire.

William Osbaldeston, Esq; Member of Parliament for Scarborough.

Colonel Arthur Owen.

Hugh Owen, Esq;

Mrs. Kath. Owen, of Chocaenog, near Ruthin.

Mr. Will. Owen, Bookseller, at Temple-Bar.

P.

Mr. Thomas Palmer.

Robert Pardoe, of Lincoln's Inn, Esq;

Mr. John Parker, Agent to his Grace the Duke of Ancafter.

John Parry, of the Middle Temple, London, Esq;

Vincent Parry, of Carnarvon, Gent. Attorney at Law. Charles

Charles Pinfold, L. L. D. Advocate to the
Lords of the Admiralty, at Walton, in
Buckinghamshire.

The Rev. Mr. ——— Powell, of Brecon.

James Powell, Esq; of Swansea, Merchant,
6 Books.

The Rev. Mr. Hugh Price, Vicar of Nant-
mel, 2 Books.

James Price, Gent. Attorney at Law.

John Price, Esq;

John Powell Price, Esq; of New Town Hall,
in Montgomeryshire, 3 Books.

Owen Prichard, of Liverpool, Esq; Merchant
and Alderman.

Edward Philip Pugh, of Coytmore, Esq;

Q.

Frederick William De Quadts, of Westphalia,
in Germany.

R.

Mr. George Reynolds, Merchant, at Bristol.

Mr. Thomas Reynolds, Printer, in Dean Street,
Fetter Lane.

Mr. Thomas Richardson.

John Roberts, of Bala, Gent. Attorney at
Law.

Maurice Roberts, of Bala, Gent. Attorney at
Law.

Mr.

Mr. Robert Roberts, Officer of the Excise at Llanrwst.

Thomas Roberts, of Denbigh, Esq;

William Roberts, of Bodjor, Esq;

William Roberts, of Pwllheli, Gent. Attorney at Law.

The Rev. Tho. Rutter, A. M. Vicar of Llanynnis.

S.

Sir Tho. Salusbury, Knt. Judge of the High Court of Admiralty, Offley Place, Hertford.

John Salusbury, Esq; of Bachegraig, in Flintshire.

Mrs. Katherine Salusbury, of Ruthin.

Mrs. Margaret Salusbury, of Ruthin.

Robert Salusbury, of Green, near Denbigh, Gent.

Edmund Sawyer, Esq; one of the Masters of the High Court of Chancery.

Mr. Robert Scoles.

Mr. John Lebrecht Schmeidle, Jeweller, in Suffolk Street.

Mr. Ephraim Rinhold Seehl, Chemist, at Blackwall.

Mr. William Shaw, Painter.

Mr. Francis Smedley, of Holywell, in Flintshire.

Mr. Robert Snell, Land-Surveyor.

Mr. James Spencer.

John

John Spranger, Esq; of Southampton Street,
Covent-Garden.

Mr. Robert Swindale, of Presteign, Radnor-
shire.

T.

Mr. John Taylor, Oculist, of Hatton Garden.

Robert Taylor, M. D. Physician Extraordi-
nary to his Majesty.

Evan Thomas, Esq, of Lloynmadog, Brec-
nockshire.

Henry Thornhill, Esq; of Chesterfield, in
Denbighshire.

John Thornhill, Esq; Serjeant Painter to his
Majesty.

The Rev. Mr. Thomas Tonman, of Little
Budworth, Cheshire.

William Travers, of Trevallin, in Denbigh-
shire, Esq;

Mr. William Tuting.

The Rev. Mr. Michael Tyson.

U.

Miss Elizabeth Vaughan, 2 Books.

Hugh Vaughan, of Hengwrt, in Merioneth-
shire, Esq;

William Vaughan, of Plaffnewidd, in Llyf-
faen, Gent. Attorney at Law.

Miss Anne Vernon.

The Rev. James Vincent, A.M. School-master
of Bangor, and Rector of Llanfair Vechan.

W.

Mr. Henry Wentworth, Surgeon, of St. Peter's Hill, London.

Taylor White, F. R. S. Esq; his Majesty's
other Justice of the Great Session of
Carnarvon, Merioneth, and Anglesey.

Andrew Wilkinson, Esq; Member of Parlia-
ment for Aldborough.

Bennet Williams, of Peterhouse College,
Cambridge, Esq;

The Rev. Edward Williams, A. M. Usher of
Ruthin School, and Rector of Evenechtid.

Mr. John Williams, Agent to his Grace the
Duke of Ancafter, at Gwedder.

John Williams, Esq; his Majesty's Chief Ju-
stice for Glamorgan, Brecon, and Radnor.

William Williams, of Glan'rafon, Esq; his
Majesty's Attorney for Carnarvon, Merio-
neth, and Anglesey.

George Wilfon, of London, Gent.

Mr. Samuel Wilfon, of ditto.

Mr. Daniel Winter, of Brecon.

William Winter, of Brecon, Esq;

The Rev. Mr. — Wright, of Wainfleet,
Lincolnshire.

Pierce Wynne, of Llanychan, near Ruthin, Esq;



T H E

INTRODUCTION.



LANDRINDOD is a small Parish, situated in an obscure Part of the County of *Radnor*, in *South Wales*: The nearest Market Town to it is *Built* in *Breconshire*, about five Miles distant towards the South. *Rayndor*, another Market Town, lies towards the North-west the same Distance from it. *Knighton*, a Market Town in *Radnorshire*, is towards the North-east; and *Knighton*, another Market Town in *Herefordshire* towards the East, each twelve computed Miles distant from it. *Aberystwith* in *Cardiganshire* is the nearest Seaport to this Place, and is computed twenty-five Miles distant, *Shrewsbury* thirty, and *Hereford* twenty-four. *Brecon*, the Market Towns *Hay* in *Breconshire*, and

B

Prestein

Prestein in *Radnorshire*, are also twelve Miles from *Llandrindod*. The Miles I'm speaking of are computed, and so long, that at least two of them make three measured ones; the general Computation being found, upon Trial, to be one Third above the Measure, in this County.

Llandrindod is a *Welsh* Name, which signifies in *English*, *Trinity Parish*. It is situated on a Common, which extends itself to three more Parishes: This Common is computed four Miles in Length, and rather more than half a Mile broad. In that Part of the Common that belongs to the Parish of *Llandrindod*, the Medicinal Mineral Springs shew themselves. The Saline Pump-water, and the Sulphur, commonly called the *Black Stinking Well*, rises forth in a Tenement belonging to the Estate of *Thomas Jones*, Esq; a Gentleman in the Commission of the Peace for the County of *Radnor*.

The Chalybeate Rock-Water springs up in the Common, which is the Property of the Crown. This Common is in the Manor of *Coutre Melanith*, of which *Thomas Lewis*, Esq; of *Hampton* in *Radnorshire*, Member of Parliament for *New Radnor*, is Steward.

INTRODUCTION 3

The Land adjoining to this common is rural, pleasant, open, and gradually ascending; by which Means it compasses a spacious Plain; nor are the Summits of the Hills near so high and steep, as the *British Alps in Carnarvonshire*: So that the Air cannot stagnate here; neither can the Plains be incessantly watered with a Deluge of Rain, as some Parts of *Wales* are; because the Tops of the Mountains aspire not so high as to break the Clouds as they ascend; farther, their Origin must be as distant as the Sea, twenty-five computed Miles.

The Air that ventilates this Common is no where obstructed, but fans and refans from Corner to Corner from any Point whatsoever it may happen to blow. The Air is exceeding healthy, and suitable to most Constitutions; for Experience has confirmed and demonstrated, that the most weakly and consumptive kind of People revive and gather Strength in it. The moist Sea-Air is entirely out of the Question, by reason of the great Distance, as well as on Account of its Height; for I reckon the lowest Part of this Common at least 150 Yards perpendicularly higher than the Sea at High-water Mark: Nevertheless the Air is neither too keen, nor too moist; for (as we have before ob-

B 2

served

served) the Situation is sufficiently elevated, that no Bogs or Fens, or any other moist exhaling Vapour can affect it. Nor is it too hot or sultry, but of a mild Temperature: In short, it is such an Air as is required for sickly and declining Constitutions, and may be deemed the *Montpelier* of *Great Britain*.

The Soil hereabouts is rich, and very fit for Vegetation. The Exhalations are of a salutary Nature; and all Vegetables that are produced, are endowed with good Qualities. Hence it is that excellent Cattle are reared here; and true Health, with good natural Strength, is the Sign which the Inhabitants of *Llandrindod* wear in their Countenances.

Llandrindod also produces excellent Barley, from which good Liquor is brewed there, to the great Comfort of many of its Visitors; it is clear and transparent, agreeably bitter and palatable; it keeps the Body open, and passes plentifully by Urine: In short, the Malt-Liquor there is an Evidence of a healthy Atmosphere, because it depends upon the Fermentation; upon which Air, Water, and all the Elements have an Influence; and to such a Degree, that if one of them is amiss, the whole fermented Product suffers so much, that all the Art of Brewing cannot rectify

rectify it. Now as that is not the Case here, but a fine, wholesome, well fermented Malt-Liquor is produced, we may therefore safely conclude, that every Thing thereabout is endowed with salutary Properties.

The Soil or Surface of the Earth is a blackish Brown, and a particular Fatness strikes our Attention ; on examining the same, we find it plentifully mixed with a mineral Bitumen ; hence it is, that it may be very easily rendered fit, or properly prepared, for producing all kinds of Vegetables, that are natural to this Climate ; but if the Culture is neglected, then a Barren Moss over-runs it ; and of all this the Ground about *Llandrindod* gives Proof.

This mineral Bitumen is certainly the Effect of the Coals, that are contained in the mineral Zonic of *Llandrindod* ; and I doubt not in the least, but that the Beds of Coal in this Zonic range a great Way, and that they have their natural Connexion with other Collieries, in *South Wales* ; as, I am persuaded, will evidently appear, as soon as the Coals in *Llandrindod* Neighbourhood come to be discovered, a Commodity much wanted there.

The Medicinal Mineral Waters have ushered themselves into Vogue by their own Merit ; no Scribbling has ever been attempted in their Fa-

6 INTRODUCTION.

vour, which, I am well assured, would never have availed there ; for nothing but the extraordinary Merits of their mineral Contents could ever have rendered the Place, from the Condition it was in, a fit Reception for the genteelest Company ; their good Effects are so conspicuous, that they give Place to none in *Europe*. I beg Pardon for the Boldness of this Expression ; but I beseech my Readers to weigh it coolly, and to point out a Water in *Europe*, that can challenge the Pre-eminence ; I will then willingly give up my Assertion : But I declare, I have seen, and made Trial of several Medicinal Mineral Waters, in divers Parts of *Europe*, and have read of many more, that have been tried by more able Hands, but as yet I have not met with any, of the same Kind, that surpass these at *Llandrindod*.

How long these Waters, thro' their own Merit, have been in Repute and medical Use, cannot be ascertained ; for all the Enquiry I could make amounts to this, that they have been used Time immemorial. Mr. Jones, the Land-Owner of the Saline Pump and Sulphur-Water relates, that his Father informed him, that about sixty Years ago, the *Vaughans*, a considerable Family in *Herefordshire*, did then frequent these Wells, and stayed there some
Weeks,

Weeks, and used these Waters with Satisfaction; but for what Disorders, or after what Method they were made use of, there is not the least Account given.

At all Times there has, in the Summer Season, been a Resort of the common People in great Troops, who made use of these Waters on all Occasions; the Success that has attended this vulgar Use has not only continued the annual Pilgrimage to this Fountain of Health, but has greatly increased it.

The better Sort, or genteeler Part of Mankind, did not begin to resort thither till about twenty Years ago; who more and more frequent this Place ever since. There are new Improvements made for the Accommodation of People of Distinction by Mr. *William Grosvenor*, a Citizen of *Shrewsbury*; who, about seven Years ago, took Leases of several Houses, and with a vast Expence not only repaired and fitted them up, but also added additional Buildings; particularly one, which is spacious enough to contain several Hundreds of Visitors.

If ever a Projector deserved to be immortalized, it is Mr. *William Grosvenor*, for his Merit in bringing this Place to such a Receptacle for the Sick; in my Opinion a Statue ought to be erected to his Memory: He still goes

8 INTRODUCTION.

on with the most expensive Improvements, and provides this Place with every Thing that can be desired or thought of.

In the Elegance of Entertainment Mr. *Grosvenor* is assisted by his Brother-in-Law Mr. *Ingol*; and between these two all imaginable Care is taken to please the Visitors.

As yet there are no Baths there; but as they may so easily, and in so short a Space of Time, be made ready; and as they are such a material Article in chronic Diseases; I therefore have treated of them, just as if they were already in Use at *Llandrindod*: However, no Patient that requires Bathing need refrain going to these mineral Waters on this Account; because a Bathing Tub may be made in two Days, and the Water may be heated in a common Boiler; and this is all the Apparatus that is required for this Purpose.

B O O K I.

An Experimental Dissertation on the Saline Chalybeate Water of Llandrindod, commonly called the Rock-Water : Wherein its Qualities are considered and explained, its Efficacy in Distempers described, and proper Directions given for its medical Use.

C H A P. I.

The Rock-Water experimentally considered.

IN the Introduction, I have already furnished my Readers with a medical History of the Waters, and given them a geographical Account of the Place, called *Llandrindod*, in Respect to its Situation ; I will therefore, without any farther Preface, proceed to treat of these Waters ; and when I have executed my Task according to the Plan specified above,

I will

I will next speak of the other two medicinal Springs of *Llandrindod* in the same manner.

I made the Experiments the 30th of *August*, 1754, on a clear serene Day, when the Sun was in its Lustre, and the Wind blew directly East; all which Circumstances furnished me with an Opportunity the most suitable to my Purpose, and my then present Occasion. The Water issues out of a Rock, near a small Rivulet; the Rock, according to the Phrase of Mineralists, is called a *Water-Slate*; which, from its natural Composition, Texture, and inherent Principles, like a Matrix, is perfectly adapted to contain this Species of Fossil, and to produce such like mineral Waters. For when the Slate is dug out of the Ground, and exposed to the Air, it moulders or dissolves into Earth; which Earth contains a large Quantity of Iron Earth, Salts, and Sulphur (or what with greater Propriety might be called an *Inflammabile*) so that we may with Certainty affirm, that this Water runs thro' the true Soil, as other mineral Waters of this kind do. This Slate-Rock heads almost a full East Point, and dips, of Consequence, almost a due West one.

Experiment 1. A Glassful of this mineral Water, taken out of the Rock on a clear warm Day, appears, at first, like common Spring-Water, and as clear as Crystal; nor are there any mineral Particles to be seen in it; but after standing some Time it changes into a Pearl Colour.

Exper. 2. By standing it does not separate by Cuticle, or otherwise, its mineral ferruginous Contents, as the *Tunbridge*, and such like chalybeate Waters do; a Proof that the latter are destitute of Salts.

Exper. 3. When first it comes out of the Rock, and as long as it preserves its crystalline Clearness, it has a strong chalybeate Taste and Smell; but as soon as it loses its transparent Limpidity, both that Taste and Smell, in a great measure, leave it, and the saline Properties become predominant.

Exper. 4. Notwithstanding the extreme Elasticity and Volatility of the Iron Contents, yet it is plentifully stored with them, as is evident from the Quantity it precipitates or lets fall in its Passage out of the Rock, and from the deep Tinge, or rather thick Fur, the Vessels receive which it is constantly drank out of.

Exper.

Exper. 5. These ferruginous Particles, or this natural precipitated Crocus of Iron, is accompanied with that greasy unctious Iron Mucilage, which sooner and more powerfully pervades Bodies than Quicksilver; and if you throw this Crocus into an ignited Principle, a sulphureous Effence appears; for it emits a black Flame, as other Minerals abounding with Sulphur do; and is so strikingly offensive to the Sense of Smelling, as to excite a temporary Fit of Coughing in the Standers-by, and seems to them perfectly suffocating.

Exper. 6. At the Spring-head this Water strikes a deep Purple, with Powder of Galls, and green Tea; which changes at last Blue.

Exper. 7. With Oak Bark, at the Spring-head, it strikes first a Violet, and then a deep blue Colour.

Exper. 8. These several Tinctures, with the Help of vitriolic Acids, may be destroyed, and the Water by that means restored to its pristine crystalline Limpidity.

Exper. 9. That which drops out of the Rock, and which, from its Scarcity, I suppose, is vulgarly called the Brandy, does not strike such deep Colours, as that which runs plentifully out of the Pipe; nor was it, in any of
the

the above related Experiments, found to be equal in Strength.

Exper. 10. When this Water has stood an Hour, or after it has been carried to the Long Room, it will not tinge or strike any Colour with powdered Galls, green Tea, or Oak Bark.

Exper. 11. Altho' the chalybeate Contents are exhaled, yet it may be drank ; nor is it ungrateful, nor does it sit uneasy on the Stomach ; but by how much more the mineral Particles are evaporated, by so much more powerfully and immediately it exerts its Purgative Quality.

Exper. 12. Cochineal in this Water causes a blue Colour.

Exper. 13. Oil of Vitriol makes this Water hot.

Exper. 14. Rough Cyder and fine Sugar mixt together with this Water, at the Fountain-Head, raises, according to the common Phrase, a Fermentation ; but this Phenomenon here (if one would maintain a strict Meaning, as well as a Propriety of Expression) can only be called an Ebullition : In like manner the *Pouhon* and *Pyrmont* Waters excite the same Appearance with *Rhenish* Wine.

Exper.

Exper. 15. This Water being added to fresh Milk does not curdle it, but they intimately and smoothly unite together.

Exper. 16. With Oil of Tartar *per Deliquium*, with Spirit of Hartshorn, with Spirit of Sal Volatile, and with a Solution of Salt of Wormwood, this Water appears as white as Milk; but at length determines into a yellow Colour, or rather into that which more inclines to a Parrot-Green.

Exper. 17. Spirit of Vitriol, Spirit of Salt, Spirit of Nitre, and the sulphurated Spirit of Sal Ammoniac, keep this Water in its original Form and Texture, and preserve its Transparency.

Exper. 18. Alum and crude Sal Ammoniac make but little Alteration in this Water, and cause no Precipitation.

Exper. 19. *Saccharum Saturni*, or Sugar of Lead, makes this Water appear to be Milk-white; and at length causes it to let fall a yellow-grey Precipitate.

Exper. 20. A Precipitation *per se* cannot be made of the ferruginous Principles or Contents of this Water; nor can they be obtained complete by one done by Art; that is, farther than with the Help of the mucilaginous Bitumen, which adheres to the Cups and Glasses,

out

out of which it is constantly drank, as observed in the 4th Experiment; yet the Iron Earth may be got by Evaporation, provided there are but about five Drops of Spirit of Vitriol added, at the Fountain-head, to each Quart of Water, that is taken out for the Process of Evaporation.

Exper. 21. Silver Leaves, after suffering them to lie some Days in this Water, turned not black, nor were they visibly discoloured.

Exper. 22. When the Water is evaporated, and the Salt separated from the Iron Earth by Solution in distilled Rain-water, we find that each Quart contains about fifteen Grains of true real natural Crocus of Iron, and about five Grains of the bituminous Mucilage of Iron.

Exper. 23. The Crocus or Saffron Colour is communicated to it more perfectly, by reverberating it strongly in a Crucible; after which pulverize it, and the Magnet will attract it like other Filings of Iron.

Exper. 24. The Salts, whilst united with the terrestrious Parts, cause a gentle Effervescence with vitriolic Acids; but when purified and recrystallized, neither these Acids nor Alkalies have any Effect upon them; they do not produce large Crystals, but shoot into short
Spangles

Spangles of a delicate Texture ; nor do they go mealy in the Air.

Exper. 25. The Salts, when put into an ignited Crucible, crackle or decrepitate very little, not near so much as the Salts of the *Pyrmont, Spaw, Cleves, Scarborough*, and other Waters of the same Nature do ; and the Fumes that arise are volatile, and smell acidulous.

Exper. 26. These Salts do not fuse so easily in the Fire as other Salts ; and when they do, they melt like Wax ; or run like Oil ; nor do they in the least swell or calcine in the Fire, as is common and natural to Alum, and other native Salts of the *Sal Mirabile* kind ; but when cold they appear like smelted Borax, and the vitriolic Acids have no Effect on them.

Exper. 27. The Air has no manner of Effect upon these fused Salts, as it has upon Salt-Petre, Salt of Tartar, &c. which after Fusion, like other Alkalies, dissolve in the Air ; but these remain vitrified, in the same manner as Borax does after smelting.

Exper. 28. In the bituminous Iron Mucilage, when put into an ignited Crucible, and the Heat increased, there appears, from the Beginning to the End of the Experiment, nothing besides its natural Iron Sulphur ; except

cept that some Part of the volatile elastic Spirits may be perceived, by exposing some Speltre Ashes in Silver Leaves within the Reach of the Exhalations, that arise out of the Crucible.

The bituminous Iron Mucilage here spoken of, is that tinging, shining Matter which is intimately combined or united with the red Iron Ore; it is of a penetrating Nature, and pervades Skins and Leather immediately; from whence it is called, by some, the Mercury of *Mars*, or Iron. It is with this kind of Iron Ore they mark Sheep, and it is this mucilaginous Matter which causes the Mark. *Note*, This Substance ought to be more narrowly scrutinized and examined into, than it hitherto has been, as well for the Improvement of Pharmacy, as of Metallurgy.

Exp. 29. By the above-mentioned Method of exposing Speltre Ashes in Silver Leaves within the Reach of the Exhalations, that arise out of the Crucible, the elastic volatile Spirits are so far reducible, as to bear an experimental Examination, and to become the Object of Sense; by which it will be found, they are of the Succinum or Amber kind: Nor will it, I hope, appear astonishing, that Amber is made manifest in these Researches, when it

is certain, that Amber is found, in several Places, in the Iron Mines, as well as upon the Sea Coast in *Prussia*.

Exper. 30. This Water contains in each Quart about forty five Grains of Salt, after being freed and cleared from every other foreign Substance.

Exper. 31. In a small Degree this Water is Purgative ; yet the chalybeate Ingredients are so prevalent in it, that they cause Inflammations in sanguine Habits.

Exper. 32. Spirit of Vitriol has no more Effect upon the natural Crocus, than it has upon the artificial Crocus of Iron.

Exper. 33. Through a Microscope this natural Crocus of Iron appears in real Flakes, and not shot in Spangles, Darts, or spicular Forms.

Exper. 34. Fuse this Crocus, and you produce a Glass, of a deep green Colour.

Exper. 35. After putting this Salt into a Retort, and giving it a subliming Fire, no Sublimate could be produced.

Exper. 36. With twenty Grains of the Sediment I mixed fifteen Grains of white Arsenic, and then sublimed it in a *Florence* Flask ; upon which, in the Neck of the Glass, I obtained a yellow Arsenick.

Exper.

Exper. 37. The specifick Gravity of this Water is variable; at the Spring it is always the highest; and altho' it contains such a large Quantity of Salt, yet, upon it first issuing out of the Rock, it is very near as light as common Water; but as soon as the ætherial elastic Spirits are evaporated, it encreases considerably in Weight; yet it does not become so heavy, as to disagree with any Constitution, that drinks it after the chalybeate Contents are exhaled.

These are the Experiments, which, I trust, are sufficient to convince the World, that this Water is not a common Chalybeate, but that it is a mineral Water participating of Iron, Salt, Sulphur and Vitriol; and consequently is Metalline, or what, according to the Expression most in Use, is termed, *Salino-Sulphureo-Chalybeate*.

I refuse not to give it the Appellation of Chalybeate, on Account of the Impropriety of the Term, but because it contains more Principles than those Waters commonly called Chalybeates do. You see I make Use of the Term in Compliance to Custom, being sensible, that from a long Use of it we conceive a just Idea of the Thing meant; so, was I to

alter it for one more proper, I perhaps should speak less intelligibly, *Nam aliquid consuetudini semper est concedendum*; yet I would not be thought ignorant that Chalybs or Steel is an artificial, not a natural Production; that is, something not to be met with in the Bowels of the Earth; and of Consequence that Water cannot be impregnated therewith.

1. The Rock, out of which this Water issues, and from which it receives its Contents, is altogether consistent with the Regularity and Uniformity of natural Productions; and from the dipping and heading of the Rock we may safely conclude, that this Water neither is, nor can be, any way weakened or damaged with Floods or Rain, such generally coming from other Points of the Compass; besides, the natural Strata guard it from such Inlets. Nor is this a mere Conjecture, but stands confirmed by the first Experiment; for was its subterraneous Passage so spacious, as to admit of every occasional Mixture, it would be impossible to receive the extremely fine volatile Parts at the Origin of the Spring; as they certainly would evaporate in the first void Space they entered: To this we may add the Confirmation of daily Experience, *viz.* that the Run of the Current is always the same,

same, neither more in rainy, nor less in dry Weather; that at all Times it preserves its Limpidity, and carries its volatile Parts along with it, even to the very End of the Spout.

2. This Rock undoubtedly supplies the chalybeate Contents (notwithstanding it will not precipitate them *per se*, agreeable to the second Experiment) as other chalybeate Waters do, which are destitute of Salts; the Plenty of which here is the sufficient Cause that prevents this natural Precipitation, and renders the artificial ones so difficult; for as soon as the volatile Parts are fled, we find, by the third Experiment, that no Traces of the ferruginous Qualities remain apparent or obvious to the Eye, Taste or Smell; but the saline Property becomes so entire, or at least so predominates, as to take up all our Senses.

3. Altho' we cannot cause an actual and visible Precipitation of the chalybeate Contents; that is, altho' a given Quantity of Water does not so entirely deposit them, as to render the whole obvious to our Senses, but keeps them suspended, and entangled with the other Principles; yet the common Law of Nature, Gravity, sufficiently shews, that the Water is plentifully stored with them; for the Fur or Lining of the Pipes, as men-

tioned in the 4th Experiment, consists chiefly of ferruginous Particles ; which the fifth Experiment more fully proves ; but not only this imperceptible Precipitation (if I may be allowed the Expression, because we see not Nature whilst at work) together with the fourth and fifth Experiment, but the several other succeeding ones place the Thing beyond Dispute.

4. That the Contents are truly ferruginous ; and that the ferruginous Contents are intimately united with the watery Vehicle, and thus constitute a medicinal chalybeate Water, is indisputably proved by the sixth and seventh Experiments : For nothing is more conducive to prove the medicated chalybeate Contents in these Waters, than the Astringents therein mentioned, *viz.* Galls, and Oak Bark ; which they as certainly and as constantly obey, as the Needle does the Loadstone ; and manifest their Existence visibly to the Eye, upon their Admixture.

5. Nothing in Nature will dissolve metal-line Particles, and unite them with a watery Vehicle, except the vitrioline Acid. Those therefore who entertain the Chimera of a *Gas Sylvestre*, or maintain a certain occult Quality, speak, in an unintelligible Jargon, of some imaginary

ry

ry Notion grounded upon no Experiments. Moreover, the acidulous solvent is proved by the eighth Experiment; for as there is no more of it, than what barely suffices to unite the mineral Contents with the watery Vehicle; and there being a near Affinity betwixt the Astringents and the Solvent, they attract each other: Hence the Solvent being imbibed or swallowed up with the Astringent, the mineral Particles are set free; which, coming into closer Contact with one another, according to the known Laws of Gravity, fall to the Bottom; where they then appear in their natural Colour. This Affinity, or the Propensity that certain Bodies have to attract each other, is manifest in several Processes in Metallurgy; but in none more simple, and at the same Time more conspicuous, than with Iron Filings in a Solution of Silver; when, upon adding the Filings of Iron to the Solution, you may see the *Aqua Fortis* greedily attract the Iron, and loose and let fall the Silver to the Bottom of the Receiver. Again, according to the eighth Experiment, as soon as a Quantity of Acid is added, sufficient to overpower the Astringent, the metalline Particles become reunited to their former Vehicle: Which, after due Deliberation, I hope, will convince those,

who place another Solvent in Opposition to the vitriolic Acid.

The ninth Experiment, I hope, will bring those to be of a contrary Opinion, who suppose the Dropping stronger, than that which comes out of the Spout : For let us only consider, how speedily the Air attracts the chalybeate Contents from the Water ; or, in other Terms, how soon they evaporate in the Air ; and we cannot but immediately conceive, that that which continues longest in the Receiver is most exposed thereto ; and must, in Proportion, be most divested of those Qualities, we so much endeavour to preserve.

6. By the tenth Experiment we are again convinced of the extreme volatility of the metalline Contents, which renders them better for medicinal Purposes, than those which are less digested ; because they cannot be volatile, unless, by Maceration, Attrition, and Rarefaction, they are reduced to the minutest Atoms. Hence we may reasonably suppose, that they are perfectly adapted to pervade the most minute capillary Vessels of the human Fabric ; a Circumstance of the utmost Importance in an obstructed Constitution. And here again, in the eleventh Experiment we meet with another Quality in this Water,
rarely

rarely to be met with in other Chalybeates, viz. that after the Exhalations of the volatile Contents, this Medicine is not disagreeable to the Stomach, but only becomes more or less purgative, according to the greater or lesser Evaporation ; an Incident, which the least medical Knowledge will teach us to reap the Advantage of : For, in some Constitutions, the chalybeate Ingredients produce Costiveness, excite too great Commotions, raise Heats, and kindle an inflammatory Fever, or at least a Hectic one ; in which Cases a gentle purgative Course is absolutely requisite ; but the common saline Openers, which never have had any Connexion with ferruginous Principles, are generally too cooling, rake the Stomach too much, occasion Gripes, relax or weaken the Bowels, and bring on Diarrhæa's. The Vegetable and resinous ones, on the other hand, are too inflammatory : Both which pernicious Events may be happily prevented, and removed with this medicinal mineral Water ; because we may suffer an Exhalation of the chalybeate Contents to such a Degree, as not to act in Contrast or Opposition with the slow feverish Disorder ; and yet have as much of them, as not to cool too much the internal Viscera, rob them of their salutary Mucus, or destroy
their

their natural Elasticity : We may soon arrive at this happy Medium, if we gain but a competent Knowledge of the Patient's Constitution ; nay, every Patient may attain to it himself, if he begins, and continues for a few Days, in a moderate Use of these Waters, and observes what Effects they have on him.

7. By the twelfth Experiment, the Existence of the metalline Contents is again made manifest. The Phænomenon of the 13th is universally the same that is common to all mineral Waters. By the fourteenth we are convinced, that the ætherial elastic Spirits are possessed of the same innate Qualities and Virtues as those of *Pyrmont* and *German Spaw* ; for the Ebullition or Effervescence raised with Cyder and fine Sugar, is intirely owing to the Spirit of the Waters ; and not to an Alkali, as some learned Gentlemen have imagined. An opposite Experiment will convince the dubious of the Truth of this Assertion.

8. A natural mineral Acid has seldom such austere Qualities, as the artificial fermented ones ; and wherever we meet with rough Effects in a natural Acid, it is most commonly owing to other Mixtures : However, the Acid in this Water is of a benign, homogeneous Nature,

ture ; and will not so much as curdle Milk, as is proved by the fifteenth Experiment ; a Quality of no mean Consequence ; because it may be mixed and taken therewith ; which in tender Constitutions is not only serviceable, but frequently necessary. Such therefore may beneficially use a Milk Diet, under a Course of these Waters.

9. The small Quantity of Precipitate we meet with, in the sixteenth Experiment, caused by Alkalies, evidently shews, that the vitriolic Acid is the solvent Menstruum of the metalline Contents: And undoubtedly the Precipitate would appear in a greater Quantity, was the Water destitute of Salt, and the unctious Matter common in Iron Ore, and which is plentifully dispersed through this Water ; as will appear hereafter. The Mixtures with Acids in the seventeenth Experiment corroborate the same. But why we have no Precipitate, in the eighteenth Experiment, is owing to the Quantity of Salt, which the Water contains ; which keeps the metalline Particles attenuated and divided, and as it were on float ; so that nothing but an Alkalie, of a direct opposite Quality, can have any Effect thereon.

10. In what manner the Iron Earth may be collected ; in what Quantity extracted ; and
that

that the same is actually an Iron Earth, or the real metalline Parts of Iron ; we learn from the 20th, 22d and 23d Experiments : And the 30th Experiment gives us the Quantity of Salt contained in the Water.

11. Of the Nature, Texture, and whatever else appertains to the Salts, we are informed in the 24, 25, 26 and 27th Experiments. From which we are assured, that this Salt has no Connexion, or Relation, with any of the Alum Tribe ; for any Salt, that grows mealy in the Air, and heaves and swells in the Fire, participates certainly of the Nature of Alum ; but the Reverse does not. Nor does it bear any Similitude to the common esculent Salt ; for the Characteristic of common Salt is, to decrepitate or crackle in the Fire. Hence this Water gains the Ascendency over most saline chalybeate Waters, by being destitute of a Principle, which they are frequently too much loaded with.

12. It has been unanimously asserted by *Stahl, Neuman, Hoffman*, and many other Gentlemen of the first Class in the Faculty of Physick, that the Salts in all mineral Waters, both hot and cold, were all of the same Species, nothing else but a natural *Sal Mirabile* ; that their Basis was the subtle Earth of common Salt,

Salt ; which, if extracted and added to common Water, gave it the same Efficacy with the mineral Spaw. The first Imitation of Nature in that Way, or the artificial Production of *Epsom* Salt, now so called, was the Thing that fixed them in this Opinion ; the real natural saline Spring was rendered famous all over *Europe* ; and this Character gave the Salt the same Renown ; which, with the Greatness of the Consumption, put them upon making the Experiment. The Attempt answered their Expectations, or rather Wishes : And finding the Succedaneum not to be distinguished, and possessing the same purgative Effect, in respect to the Strength and Quantity of the Dose, they concluded, that both one and the other were endowed with the same Principles ; and thereupon declared, that the artificial Salt would answer all the Ends and Purposes, and was equal in Goodness to the natural Salt of *Epsom*, and even to the saline Spring : Which soon put an End to its Exportation. But this was not all ; their rash Judgment was attended with much worse Consequences ; for Experience has since convinced us, that the artificial Salt weakens the human Frame (a Thing common to all artificial and extracted ones, if made too free with) whereas
the

the natural ones, whilst in the Water, by no means hurt the Constitution, but rather invigorate it. Experience also has since rendered it indisputable, that there are other Kinds of Salts in the Entrails of the Earth, which mix with certain medicinal mineral Waters, as well as those that appertain to the Genus of *Sal Mirabile*.

13. It is then evident, from the 26th and 27th Experiments, that the purgative Salt of this Water contains a large Quantity of Borax-Salt. I could bring a great many more Arguments to prove this my Assertion; but as they are of a chymical Nature, I will wave them, for the present, and appeal to those that have made use of the Waters; if they will but compare their Effects with the Qualities and Virtues, which *Stahl*, *Newman*, and other Writers of the first Class in Physic, attribute to common Borax; particularly as its Attributes stand confirmed by Experience, and are as follows. Borax, they say, is forcing, inciding, and aperitive; it promotes Delivery; expels the After-birth; provokes the Menses; stimulates to Venery; excites Urine; and is almost a certain Remedy in the *Fluor Albus*, provided general Evacuations and Purifiers are premised.

premised. Let these Properties be duly compared with those of this Water, and their near Affinity will soon be found, and give Occasion to any one to pronounce, that they are not to be met with in the common purging Salts.

14. Borax, by itself, is not purgative; therefore as this Water, as has been observed in the 31st Experiment, is in a small Degree purgative, it is not to be doubted, but that a purgative bitter Salt is concomitant with the Borax; and, as according to the 35th Experiment, no Sublimate could be raised or obtained from it, we may safely conclude, that it contains nothing more than the Ingredients of the native *Sal Mirabile*. For had it been impregnated with any other Mixture, we should certainly have met with it in the 35th Experiment; where, with a sufficient strong Fire, we endeavoured to sublime it: Yet I do not deny, but that Borax, with a strong Solution of calcined Vitriol, may be sublimated; but I aver, it cannot be done with a *Sal Mirabile*, or any Concrete of the like Genus where the Acid is volatile.

15. Ætherial, elastic, volatile Spirits are constantly attached to the metalline Contents of the chalybeate Vehicle. We shall find it so in all
Waters

Waters of this kind, in the same manner, as I have done in the 28th Experiment; which is not at all surprizing; for, as *Hoffman* very justly observes, *That this Spirit is the animating Principle of Minerals, and a certain Sign and Evidence of Mines, or an Earth productive of Metals* *; so we need not wonder, why it so assiduouſly cleaves and adheres to the metal-line Particles, they being the most proper, as well as the most perfect Receptacle in all this natural Compound: For in what manner, and in what Shape soever the mineral Contents are obtained, the volatile, ætherial, elastic Spirits are constantly, in some small Quantity, found entangled and inherent therewith. If they are the animating Principle of Minerals, &c. as *Hoffman* says, What Pity is it, that our Mineralists so much neglect Investigation into their Nature, and Characteristics, as to be utterly unacquainted with them, and to pass them frequently by unregarded? Did they know, what an Insight an intimate and perfect Acquaintance therewith would give to the Art of Mining, what Emolument to the Community, they would be inexcusable. But

* *Hoffman* on mineral Water, Pag. 30.

to my Purpose. The 29th Experiment instructs us, that the ætherial volatile Spirit here spoken of, is a bituminous Spirit, which participates of the Nature, and is possessed of the same active Qualities as Amber. And here it may not be amiss to inform our Readers, what *Hoffman* has given us an Account * of, in the same Treatise, viz. how these Spirits always change and differ in their Nature, according to the different Mixture they meet with. His Words are, as follows: “ After having said thus much
 “ of this fine mineral Spirit, Men’s Curiosity
 “ will doubtless be raised to ask the particular Nature of the Thing, whereof we relate such wonderful Virtues and Effects.
 “ To satisfy them, all we can, we must come
 “ to a chemical Consideration of the Subject,
 “ and with the Generality so well instructed
 “ in that Art, as to understand our Meaning;
 “ for we have not the least Intention to amuse
 “ Mankind, or, in any respect, force a false
 “ Notion upon them. Just Facts and Experiments are what they must be guided by;
 “ and if our Notions and Theory are not
 “ built upon these, we desire they may not
 “ stand. Our Opinion therefore is, that this

* *Hoffman* on mineral Water, Pag. 29.

“ extremely moveable, fubtle, and elastic
 “ Principle is a Portion of the univerfal Spi-
 “ rit, the Fountain and Cause of all the par-
 “ ticular Spirits in other Things, whether of
 “ the vegetable, animal, or mineral King-
 “ dom. But as this Spirit seems to have a
 “ principle Seat, and chiefly to exercise its
 “ Power in what we, in a chemical Sense,
 “ term *Sulphur*, or a pure oily and inflam-
 “ mable Matter ; and as this Sulphur is of
 “ three kinds, according to the three King-
 “ doms, Animal, Vegetable, and Mineral ;
 “ this univerfal Spirit, coming to be diffe-
 “ rently modified, altered, or changed, ac-
 “ cording to the different Sulphur wherein it is
 “ lodged, thus affumes a different Nature, and
 “ becomes productive of different Effects.
 “ By *mineral Spirit*, we therefore understand
 “ an exceeding rarified, fluid, elastic and vo-
 “ latile Substance, blended in amongst, and
 “ combined with, all the sulphureous Parts
 “ of Minerals, and pervading all the lower
 “ Regions of the Earth ; so as to become the
 “ animating Principle of Minerals, and the
 “ true Cause and Origin of the various Changes
 “ and Effects, which happen in the Bowels
 “ of the Earth : Whence it is often found
 “ amongst mineral Bodies, under the Form of
 “ a pene-

“ a penetrating sulphureous Vapour ; and be-
“ comes the certain Sign and Evidence of
“ Mines, or an Earth productive of Metals :
“ And this Spirit, coming in the way of Wa-
“ ters, as they flow along the Entrails of the
“ terrestrial Globe, is caught by them in
“ their Passage ; and thus impregnates them
“ with their medicinal Virtue.”

16. The *Crocus Martis* we obtain from this Water is no more than a natural one, as we see in the 32d Experiment ; and would, if medically used without the ætherial elastic Spirits, have no other Effect, but such as is common to the artificial Production of this kind. It is owing to the Existence of this, that we have superior Qualities in it ; and from hence it is, that all natural Remedies for ever will maintain a Pre-eminence over the artificial ones. That this *Crocus* possesses no pernicious Properties, but is perfectly agreeable to the human Constitution, we are assured by the 23d Experiment ; and that the metalline Contents are real Iron Ore, is again satisfactorily proved by the 34th Experiment. Of the peculiar homogeneous Shape of ferruginous Principles, I have treated at large in a Letter, which was published in the *Gentleman's Magazine* for December, 1751, Page

542, which, for the Benefit of my Readers, I will here subjoin.

London, October 14.

“ My LORD,

“ **I**N Obedience to your Lordship’s Com-
 “ mands, I shall now give some Account
 “ of the *Chevron* * or *Bru* Waters; and at-
 “ tempt to prove, by Experiments, their per-
 “ nicious Qualities. It is really surprizing,
 “ that any Persons, of the least Understanding,
 “ should be prepossessed in Favour of this li-
 “ quid Poison. For, from what I have been
 “ able to gather, the brisk Sparkling of the
 “ Water alone has led them to conclude, that
 “ it must be endued with sanative Virtues.
 “ But I shall endeavour to convince your Lord-
 “ ship, in the Course of this Letter, that the
 “ sparkling Quality, for which it is so much
 “ esteemed, ought, on the contrary, to deter
 “ the human Species from the Use of it; as
 “ it does Brute Animals.

“ The College of Physicians at *Liege*, in
 “ the Year 1711, made a publick Declaration
 “ against the Use of *Chevron* or *Bru* Waters;

“ * About five Miles distant from the *Pohun Spa*,
 “ in *Germany*.

“ in which they observed, among other Par-
 “ ticulars, *That these Waters receive a deeper*
 “ *Tincture, with Galls, than those of the Pou-*
 “ *hon Spa, by reason of a sharp vitriolous and*
 “ *fixed Salt, wherewith they are impregnated.*
 “ They proceed with a deal of hypothetical
 “ closet-Jargon, which, upon the whole,
 “ amounts to no more than this; That the *Bru*
 “ Waters have done much Mischief, and that
 “ the many melancholy Consequences ensuing
 “ therefrom, had obliged them to protest
 “ against their Use. This, your Lordship
 “ will easily perceive, is no more than what
 “ any common Empiric, quite ignorant of
 “ Nature, might have said; as he could
 “ readily observe, that the Votaries to these
 “ Waters were quickly carried to the other
 “ World; but what these pernicious Qualities
 “ are, which produced these fatal Effects, they
 “ have not attempted to demonstrate. How-
 “ ever, this shall not be the present Case; for
 “ I will not only impeach the *Bru* Water,
 “ but also prove, by indisputable Experiments,
 “ what are its poisonous Contents.

“ This *Bru* Water (from which I have ex-
 “ tracted the ætherial mineral Spirits) actually
 “ contain a perfect Arsenic; and the arsenical
 “ Particles are principally lodged in the

“ Sparkles that so plentifully appear in the
 “ Water ; consequently, if a large Quantity
 “ of it is taken, it will act, in all Respects,
 “ as common Arsenic, and destroy the Pa-
 “ tient ; hence it is, that all who use it, die
 “ of the same Consumption that is incident to
 “ Smelters and Artificers in Metals ; because,
 “ as most Metals contain Arsenic, the Bellon,
 “ or Smelters Consumption, is peculiarly oc-
 “ casioned by it.

“ The Iron Contents in the *Bru* Waters
 “ are, by the Arsenic in them, brought into
 “ spicular Forms, like Darts ; as may clearly
 “ be observed through a magnifying Glass,
 “ when precipitated out of the Water ; so that
 “ when they meet with a costive Constitution,
 “ or a Pressure of the Excrements, they tear
 “ the smaller Vessels of the Entrails ; and
 “ from hence it is, that frequent inward Bleed-
 “ ings are caused by *Bru* Waters.

“ These, my Lord, are their hurtful Qua-
 “ lities ; which indeed are such, as will in-
 “ duce any considerate Person to detest them,
 “ if he has the least Regard to the Preserva-
 “ tion of his Health ; and that these Accusa-
 “ tions are wholly built upon Facts, will fully
 “ appear to your Lordship from the following
 “ Experiments.

“ *Exper*

“ *Exper. 1.* Take of *Tunbridge, Islington*,
 “ or any other volatile chalybeate Water, a
 “ large Bottle-full, at the Spring-head ; and
 “ immediately after it is filled, fix a Glass or
 “ Iron Tube upon the Water in the Neck
 “ of the Bottle, and stop the Space between
 “ the Bottle and the Tube close ; but let that
 “ Part of the Tube that is out of the Bottle
 “ extend downwards, and be so formed, as
 “ to have a wide-spreading Opening at the
 “ End, like the Mouth of a Funnel. Under
 “ this put two Drams of Arsenic, and two
 “ Drams of Brimstone, well mixed together ;
 “ then set them on Fire, so that the Smoak
 “ of this Mixture may pass through the Pipe,
 “ upon the Water in the Bottle ; which, by
 “ means of this arsenical Smoak, will, in less
 “ than five Minutes, become, in every Re-
 “ spect, a perfect *Bru* Water, and bear Ex-
 “ portation.

“ *Exper. 2.* Precipitate the Iron Earth out
 “ of the chalybeate Water that has been treat-
 “ ed with arsenical Smoak, as directed in the
 “ foregoing Experiment ; and then it will ap-
 “ pear, through a magnifying Glass, all in
 “ *Spicula*, like unto sharp-pointed Darts.

“ *Exper. 3.* Precipitate the Earth out of
 “ *Bru* Water, and compare it with that ob-

“ tained by the second Experiment ; when it
 “ will be found equal, in every Respect, with-
 “ out any manner of Difference whatever.

“ *Exper. 4.* Precipitate the Earth out of
 “ some of the Water of the same Spring from
 “ whence that of the first Experiment was
 “ taken, and also the Earth out of some of
 “ the *Pouhon* Water, and examine and com-
 “ pare them with that of the first Experi-
 “ ment, and that obtained from the *Bru* Wa-
 “ ter ; and they will not be found alike, in any
 “ Shape ; but the two first will appear in small
 “ Atoms, that cannot possibly do any Hurt
 “ whatever.

“ These sharp-pointed Darts proceed in-
 “ tirely from Arsenic ; which, when mixed
 “ with metalline or mineral Contents, will
 “ always form into Spangles. This occasi-
 “ oned the false Judgment in *Lemery*, *Geof-*
 “ *froy*, and several other *French* Chemists ;
 “ who imagined, that all poisonous Qualities
 “ existed in spicular Forms : But that is far
 “ from Truth ; because Experience has con-
 “ vinced us, that whenever Arsenic meets
 “ with the Entrails and Juices of Animals,
 “ without any other mineral Contents, it will
 “ perfectly dissolve them. Hence it is neces-
 “ sary, in a Person who has been poisoned
 “ with

“ with Arsenic, that the Cadaver should be
“ examined before the third or fourth Day ;
“ else the Arsenic-Contents cannot be disco-
“ vered. But it must be confessed, when
“ Arsenic is mixt with other mineral Con-
“ tents, it is doubly armed with destroying
“ Weapons. Therefore, if your Lordship,
“ for the future, should chuse to make Use
“ of any foreign Spa-Waters, I most hum-
“ bly advise it may be of the *Pouhon*.

“ *I am Yours, &c.*

“ DIEDERICK WESSEL LINDEN.”

17. There is no Doubt of the real Existence of Sulphur in mineral Waters ; because the whole mineral Region is replete therewith. In the Course of our Experiments we have not made it apparent to the Senses ; except in the thirty-sixth, where we have made it as conspicuous, as if it was rendered corporeal, or produced in Substance : Nay, really and corporally it is there ; because Arsenic is the only Magnet for Sulphur. Yellow Arsenic, whether natural or artificial, cannot exist without a perfect Sulphur ; that is, 'tis Sulphur which constitutes the very Essence of the yellow Colour : And you may as certainly conclude

clude, from that Experiment, that the medicinal Rock-water at *Llandrindod* contains Sulphur, as if it was extracted *per se*.

As to its specific Gravity, I have spoken in the 37th Experiment; wherein I have assured you, that, tho' variable, yet it is, at all Times, suitable and agreeable to the human Constitution.

From what has been said we may safely conclude, that the Rock-water of *Llandrindod* contains;

1. A very great Plenty of ætherial, elastic, volatile mineral Spirits.
2. A mineral Balsam of the Amber kind; which is combined with the before-mentioned volatile Spirits, and the Iron Mucilage.
3. A volatile vitriolic Acid.
4. A large and sufficient Quantity of ferruginous Contents.
5. A perfect Sulphur.
6. A neutral purging Salt, participating of the Nature of Borax.
7. The common Vehicle Water.

So that this Water is a perfect purgative Chalybeate, excellently well impregnated with other salutary Mixtures, so as to become one of the most sovereign Remedies, and safe even in the most enfeebled Constitution.

C H A P.

C H A P. II.

Of the innate Qualities of the Rock-Water of Llandrindod, and its Efficacy in several Distempers.

S*T*AHL, in the most earnest manner, charged his medical and chemical Pupils to be cautious and circumspect in reading the *Cartesian* Philosophy ; and in the Pursuit of their Studies, not to suffer themselves to be intoxicated, or led away by the subtle Reasoning of that scholastic Sect. He at large demonstrated, that all Sciences had suffered by their Sophistry ; but in particular, that Physick and Chemistry could, by no means, be rendered demonstrative, scientific, or even beneficial, unless their Theory was grounded upon experimental Facts. He concluded, that none of its Precepts ought to be delivered upon Supposition. The modern Way of Writing, I fear, runs too much upon Hypotheses ; and indeed, an excellent Scheme it is to cloak Ignorance ; because, upon every Attack, the Answer is ready at Hand ; *I did not pretend it was demonstrative : I founded the Thesis but upon Supposition.*

That

That *Stabl's* Maxim, in our present Subject, above all others, is indispensably necessary, no one, I imagine, will question, or dispute with me ; for all that is delivered on mineral Waters, not backed or supported with Experiments, is not to be relied on ; since it is not level to ordinary Mens Comprehension. And one would almost imagine, that the Favourers of some mineral Water Authors, who have appeared in Publick, within these ten Years, have been the more warm in crying up the Name of the Writer, in Proportion as they have less understood the Subject ; as if any Thing merited Applause, for being difficult to be understood : However, to carp is not my Design. Since we have begun to examine the Contents of this Water, in the former Chapter, by Analysis, let us proceed by the same Rule ; as it seems the most certain ; and before we hasten to pronounce the Efficacy of this Water in Distempers, let us try and prove the innate Qualities of its Contents by the same Touchstone.

Hitherto we have had no Difficulty to encounter with ; because there happens nothing, in the Experiments of the first Chapter, but what may easily, and with Certainty, be discovered by the Sight, Smell, or Taste : But

at

at present the Case is altered. We enter now into a subterraneous Labyrinth, in which we are debarred of these Advantages ; yet we must not submit the unraveling of our Subject to Dreams, Closet-Lucubrations, ingenious speculative Hypotheses, or metaphysical Conjectures : No ; as we have begun, and laid our Ground-work upon Experiments, let us proceed in the Sequel, though difficult, upon the same Basis.

All simple pure Water is one and the same Element ; and the infinite Variety, or different kinds of Springs, are owing to the different Principles with which they are stored. Were they divested of their heterogeneous Contents, then there would be known but one Species over the whole terrestrial Globe ; but as the Case stands, pure elementary Water is nowhere to be met with ; even Rain-water is found otherwise.

One main Point to be considered, before we begin to analyze any Water, is, to observe, whether it be a Spring, or a Day Water. A Spring is absolutely necessary ; and such a one as issues forth, at all Times, in one constant regular Stream, its Current neither increasing nor diminishing ; the Reason of which is obvious. The Rock-water at *Llandrindod* is such a one :
Hence

Hence it is, that the Experiments made on it never vary, but are constantly the same, both in dry and wet Weather.

The Contents of this Water proceed from Marcasites or Pyrites, an Iron Earth, a vitrioline Acid, a Sulphur, an absorbent Earth, and from the coarsest mineral Bitumen, I mean the carbonous Fossil, or Pit-Coal; these, I say, are the Materials, that furnish the Rock-water with its healing mineral Principles. I doubt not, but the superficial *Literati* of the present Age will ridicule this my Assertion; but I will candidly assign my Reasons, that the World may see, this is not a Supposition, or a mere Conjecture; and if into the Minds of such they receive not Admittance, I will patiently labour under their Censure and Reproach. There are always Novices and Pretenders in Arts and Sciences; who, from a narrow-limited Knowledge of Things, acquire a contradicting Spirit, and oppose every Thing that is new to their imperfect Notions. I am sensible how hard it is to convict Men of this Disposition; and therefore, by these, I expect, my Assertion may be sneered at. But let the Peremptory laugh in a Multitude, and prevail over Reason. Men
that

that search into the Depth of Things, want no other Inducement, but Truth and Reality, to make them acquiesce ; the Ignorant, again, may soon be convinced ; but the half-learned have too good an Opinion of their own Understanding.

Lister and other Writers have agreed, that Marcasites and Pyrites are the sole Cause of all mineral Waters. Certain it is, that Marcasites are more plentifully lodged in the Entrails of the terrestrial Globe, than any other Fossil. No Metal, Semi-metal, Mineral, or even the Water-slate, which, we said, the Rock-water of *Llandrindod* issues out of, is divested of Marcasites. They are soluble by the watery Element, as it passes over them. They furnish the chief and most material Ingredients that enter the Composition of Spaws ; but are not the sole Repository of them, as Dr. *Lister* imagines.

It is not only the Water-slate, which composes the Rock at *Llandrindod*, that is endowed with Pyrites or Sulphur, but the whole Range or Zone of this Water is Metalline or Mineral. For towards the East, beyond Mr. *Grosvenor's* House, are the Remains of Lead Mines, out of which Ore has been very lately taken ; towards the West, at about six or seven
Miles

Miles Distance, but in the same Parallel Direction, there are very good Copper Mines already discovered : So that there is no Want of Marcasites in that Neighbourhood ; because these Metals cannot exist without them.

Through this mineral Zone native Sulphur also is every where dispersed, as well as Marcasites ; for it always cleaves so tenaciously to Metals and Minerals, that they are never found without it. We commonly have it intermix'd with other Bodies. But in the Vicinage of *Llandrindod*, we need not be at the Trouble of making a Process to prove its Existence ; as five sulphureous Springs may at present be seen thereabout ; which are so prodigiously strong, that they not only discover their natural Qualities to the Smell and Taste, but also, in great Quantities, precipitate a native *Lac Sulphuris*. And I may venture to say, that the Sulphur-Fountains of *Llandrindod* may vie with any in *Europe* ; at least I have never met with any superior, tho' I have visited Numbers in my Travels. Let it be here remarked, that I give to no fictitious or imaginary Being the Denomination of Sulphur ; I allow that Name to nothing but what is as perfect, and, in every respect, as complete, as that which is sold in the Apothecary's Shop.

The

The vitriolic Acid, so necessary to dissolve all solid Contents with Water, is not only in the Marcasites, and Sulphur, but also in its own Matrix, the Iron Earth. That Iron Earth is the Matrix of the vitrioline Acid, as it has been often experimentally proved, so it is universally known ; so that the ferruginous Particles are here dissolved with the vitriolic Acid, and by that Means conveyed and united with the Water. As to the Existence of Iron-stone at *Llandrindod*, I hope no one will question it ; especially since the Slate-rock, out of which this Water springs, abounds therewith, which the most common Experiment in Metallurgy will make evident.

Nor need we here long look for the absorbent Earth, because there is Plenty of bolar Clay in that Neighbourhood, which has always the finest absorbent Earth intermixt with it ; but we need not here go so far for it, because the very best Sort is in the very Slate that constitutes the Rock ; which, if any one question the Truth of, he need only be at the Trouble to pick some of the Clay that sticks in the Joints of the Slate-work, over which the Water trickles ; and, by washing separate the gross impure Parts, he will have an absorbent Earth, not much inferior to white Magnes.

E

Without

Without the absorbent Earth, this Water would, by no means, be a fit Medicament ; it so allays and temperates the vitriolic Acid, that, without its Mediation, we should not be able to drink it. If any of the Curious doubt of the Truth of this Assertion, I desire them to visit the Springs, where the Waters strain through Marcasites, and Iron Ore, and pass not over any of this absorbent Earth ; and they will find them so austere, and to cause such an Irritation in the Mouth, that the Sensibility of the Gullet will not suffer them to pass down ; and if the least Quantity is forcibly swallowed, it will cause the most violent Vomiting. Now the same Water, at the Fountain-head, in a few Minutes, may be made not only palatable, but also salutary, by adding a proportional Quantity of white Magnese to the contained Acid. Many of this kind of Springs may be met with in *Wales* ; but such as cannot resort to Springs of this Nature, to satisfy their Curiosity, let them take the Water that runs from Copperas Stones, which is usually collected to make Copperas, instead of that just before spoken of ; they will find it equally austere, and equally emetic ; both which Qualities they may destroy with white Magnese, in the manner above related.

Now

Now I come to prove the Existence of that Mineral called Pit-Coal, well known to the Inhabitants of *Great Britain*, being in general Use and Esteem amongst them for Fuel; but this being unheard of, or at least never found, in these Parts, I shall meet with nothing but Incredulity; even the Inhabitants of *Llandrindod*, though the Coal discovers itself both to their Taste and Smell, and though they are in the utmost want of this useful Fossil, will not willingly credit me; nay, I apprehend their Censure, for bringing the Principles of Coal-mines into their darling Fountain: But let them not be angry with me; I will not make it the less salutary; so will proceed to Facts.

I would not be understood here to mean, that a purgative Chalybeate, such as the *Llandrindod* Rock-Water is, strains through Beds of Coal, or is to be met with in every Coal Pit; which would be absurd; for I am very well acquainted, that such a Water as percolates over Coal, is no way fit for medical Purposes, but is a poisonous Emetic: Nevertheless I aver and pronounce, in order to be rightly understood, in what I am going to prove from real Facts, that a saline chalybeate Water is in no Corner of the World to be met with;

may cannot possibly exist, unless the rarefied Damps, at least within two Miles Distance from a Bed of Coal, come in subterraneous Passages, and intervene with the generative Matters that constitute such a Water.

Dr. *Henkel* was the first who was of Opinion, that no sort of Salts could exist, or be generated in the Bowels of the Earth, unless assisted by Coal Damps. He made the Discovery of changing Iron Ore into perfect Coal, and Coal again into what Salt he pleased. He remarked, that Coal was seldom found without Iron Stone; and had likewise observed, how shortly Coal altered in its Bed, provided it happened to be ventilated with a strong Current of Damps, rushing through subterraneous Passages. These, and other Circumstances, which the great Book of Nature taught him, confirmed him in his Opinion.

The ingenious Chemist soon broached this new Discovery in his *Bethesda Portuosa*, a Treatise he wrote on the mineral Waters at *Lauchstadt*, situated in the Electorate of *Saxony*; a Spaw not dissimilar in its Qualities and Efficacy to the Rock-Water, and much resorted to from *Germany*, *Poland*, *Bohemia*, *Hungary*, and divers other Parts. He openly affirmed,

affirmed, that some refined or rarefied Coal Damps was the productive Cause of the Salts which the *Lauchstadt* Water contained. And this Assertion induced his late *Polish* Majesty, who much consulted the Good of his Subjects, and, in particular, the Improvement of Arts and Sciences, to give his Orders to bore for Coal in the Neighbourhood of this Well, where the Doctor suspected them; which was, according to his Expectations, met with.

This is a real Fact, but we will pass over it; and as it may be deemed an accidental Thing in this one Place, let us range all *Europe* over, take a View, and enquire into the Nature and Origin of as many saline purgative chalybeate Waters, as we can meet with; and, I am sure, we shall find the greatest Part of them seated within two or three *English* Miles of Collieries; and the rest at the same or less Distance from saline Springs, out of which common Kitchen Salt may be made.

Let us examine the terrestrious Matter, which is precipitated, or separated in the making of all Kitchen Salt; whether it be crystallized out of Rock Salt, Sea Water, or a Salt Spring; and we shall always perceive, in this Matter, a fuccinated Scent, or a Smell

like to that, which is emitted from yellow Amber. And for further Proof, we shall find therein a real Aspheltos, such as is common to, or concomitant with, all Pit-Coal (the *Pembrokeshire* Culm excepted). Culm, properly speaking, is a black Lime-stone, plentifully impregnated with sulphureous Damps. This Concrete is not as yet sufficiently known; it has an extraordinary Efficacy in smelting Lead Ore; in which Operation it saves the Lime, and separates the Metal from the heterogeneous Mixture, much cleaner than can be done with Lime: For this Concrete is endowed with an *Inflammabile* of the utmost Purity. Hence it is that Culm, and such like Coal, is always found in Veins, and not in Beds; and that Culm has actually been a Lime-stone, and is changed into a Slate, similar to Coal, is immediately proved by smelting it with Lead Ore, when the essential Properties and Characteristicks of Lime appears. The Culm, I here speak of, is that from *Pembrokeshire*, the only one I have made Experiments with.

The aluminous Mineral, and salt Springs, are always certain Signs of Coal being in the Neighbourhood. A Salt Spring is known to be towards *Built*, in *Breconshire*, within three

or four Miles to the South of the Rock-Water; and Quantities of Alum Mineral I have seen myself, within some Miles towards the West of it.

A stinking sulphureous Fountain is, again, another certain Sign of Coal; and in the Neighbourhood of *Llandrindod* there are, to my Knowledge, four or five of them; of which I shall be more particular when I come to treat of them.

Let us filtrate the Water taken out of a Coal-work, and crystallize it, and we shall meet with several kinds of Salt (even Kitchen Salt not excepted;) and as Borax is, amongst saline Bodies, what Gold is amongst Metals, in respect of Value and Scarcity, Why may not the one be amongst other Kinds of Salts, as the other is sometimes found along with the baser Fossils, such as Copper, &c. ? Nay that it is so, is evident from long-standing Observations *.

Turbaries, again, are the Effect of Damps, and Exhalations of Coal: And as I have met with several other certain Indications of that Fossil in the Neighbourhood of *Llandrindod*, I hope the Inhabitants will soon be blessed with it: Nor is it to be doubted, since it stands

* *Jordan* on Mineral Waters.

confirmed by Experience, that these Effluvia pervade all Minerals in their Beds, and by those means agitate the different Ingredients, that enter the Composition of Salt, excite their Mixture, and bring on an Union of Parts; and as this Agitation lasts, as long as the Damps act uninterrupted, so the Water is constantly supplied with a new-generated Salt: For was the saline Matter washed from a particular Bed, as from a Magazine, it would be emptied, and worn away in Space of Time; but that it is supplied by the Mediation of these Effluvia, has been verified and experienced in many Places, where the saline Principles have become deficient, nay ceased, whenever the Exhalations have been interrupted in their subterraneous Caverns. Of this see more in my *Treatise on chalybeate Water, and hot Baths* *.

Thus far, I think, is sufficient to prove, that Coal Damps have a Share in generating and furnishing the Contents of the Rock-Water; and that this Spring would entirely be divested of Salt, was it not for the Effluvia of Coal, that mix with the other generative and productive Matter which constitutes this Water.

* Pag. 24, 25.

I hope I have said enough on the natural Properties and Qualities of the *Llandrindod* Rock-Water ; I will therefore now proceed to the Enumeration of its Virtues ; and see in what various Distempers it has, for Years past, been successfully made use of.

That this Water has maintained its Reputation more than twenty Years, and wrought such extraordinary Cures, as are related of it, is to me surprising ; as the most extraordinary Abuse and Error has been committed in the Method of drinking it. When one hears of People quaffing off thirty or forty Pints of it, one would imagine, that Divine Providence, to countenance the Spaw, seeing it for the Benefit of Mankind, had interfered, and miraculously preserved such immoderate Topers : But undoubtedly many have felt the ill Effects due to their Rashness ; tho' such we are unacquainted with : For these Waters, under the Management of the Unskilful, are like edge-Tools in some People's Hands ; and this Resemblance, all good Medicines have with each other, that nothing is capable of doing a great deal of Good, but what may do Harm in Proportion.

It is impossible here to annex Cases of Cures effected by this Water, though many have been

been performed in the Space of these twenty Years ; which is so notorious, that the afflicted Visitors annually increase in Number ; but as no Account of the Diseases, in which they have been used, has been taken, no Register made of the Cures ; and as the Waters, as has been before observed, have been immediately drank, under no other Restrictions or Regulations, but what the Fancy of every one dictated ; so we may reasonably suppose, that, had any Rule or Method been pursued, the Number would have been considerably augmented. Under these Circumstances then, we will give our Readers a Detail of the Disorders, in which they have signalized themselves ; and in which we judge they will prove beneficial.

1. This Water, in general, is good in all such chronic Cases, as proceed from a lax Fibre, or a Weakness of the vascular System ; and is particularly to be recommended, when the Disease is situated in the most remote Parts of the human Machine : Whither it is difficult, or next Door to an Impossibility, to convey the ordinary Shop-medicines.

2. In scorbutic Eruptions, that proceed from a Feebleness in the *Vis Vitæ*. Here the Circulation is so weak and languid, that the Blood

or

or Juices want a sufficient Impulse to penetrate, and pervade the small capillary Vessels; where, stagnating, they block up their Extremities, cause those little Inflammations and Abscesses, that deform the Skin, obstruct the secretory Ducts, and impede Perspiration.

3. In weak Nerves. In the periodical Asthma, whether humoral, or spasmodical. In Saint *Vitus's* Dance. In Palsies, whether partial, or total; whether from a Resolution of the Part, or a Poverty or Viscidity in the Juices. In a general Debility, or Weakness of any particular Member; whether it be the Result of a paralytic Disorder, or remain after the Cure of an Apoplexy. In Epilepsies, when other Remedies have proved unsuccessful. In Agues, that have baffled the Administration of the Bark. In Obstructions of the lower Belly, the Result of Agues. In Weakness, left after a Fever. In some erratic, slow nervous Fevers. In all Diseases incident to the Fair Sex; such as proceed from an undue Regulation of their monthly Courses; whether they flow too much, or too frequent; whether they are partially or totally obstructed; the Fluor Albus; Inflations of the Stomach, and Hypochondria; the Green Sickness; and all the various Symptoms that come under the De-

nomin-

nomination of the hysteric Passion. In weak Bowels. In Flushings, or Redness of the Face. In all Obstructions.

4. In a seminal Weakness of both Sexes.

Of chronical Disorders, that proceed from a Laxity, or a Weakness in the Fibres; and of Obstructions consequent thereon.

Altho' all, or most, chronic Diseases have one and the same general Origin, *viz.* an Obstruction either of the Viscera, Nerves, glandular Parts, or minute Vessels, which are most remote from the Heart, where the Circulation is most languid; yet the Effect this one Origin produces is different, according to the different Part affected, and so produces various Diseases; and a lax debilitated Fibre, and an impoverished State of Fluids, is generally antecedent to, or precedes the Obstruction: Generally, I say, for I don't deny, but that an Obstruction may be, and often is, caused by rich Juices, or an Immeability of the Vessels, such as is generated by strong elastic Fibres, and Organs. But such Obstructions are attended with Inflammations, Heat, Fever, Pain, &c. in the affected Part; and are to be carried off by repeated Bleeding, and antiphlogistic Medicines. These are not the Obstructions I would

would be thought to speak of ; but of such, as happen in a reverse State of Blood, unattended with Heat, Fever, or Inflammation, and in a relaxed Habit of Body, and a Constitution debilitated. And here again, a viscid glutinous Lentor, a watery State of Blood, or an acrid one, may be the Result of such a Habit, and the immediate Cause of the Obstruction : So that the Disease again is diversified, according to the different Quality of the obstructing Matter. The Obstruction, besides, may be either partial, or total. Hence a Marasmus, or Consumption, Jaundice, Dropsy, rheumatick Pains, carious Bones, Corruption of the Ligaments of the Joints, with an innumerable Train of other languishing Disorders, our greatest Pain, and Dread on this Side the Grave. But the whole of this would swell Volumes ; and, as my Intent is not to write a Treatise of Physick, but only to give a Sketch of it, that I may let my Readers have some Insight into the Nature of Obstructions, the Consequences of a lax Fibre, in order to shew them how these Waters may be serviceable therein ; I will content myself with delivering a few Words on those I have just summed up. A Marasmus or Consumption happens, when a Body ceases to be nourished ;

rished ; and a Body ceases to be nourished, either through a Defect, or a depraved Disposition of the nutritive Matter, a Fault in the Vessels, that are to receive the Nutriment, or a want of Power in them properly to apply it, where it is wanted. There is always something flying off from the Surfaces of our Bodies, from the constant reciprocal Action of the Solids against the Fluids, and the Re-action of the Fluids against the Solids ; the Attrition of Solids against Solids, and Fluids against Fluids, must constantly rub off, and consume something ; and the Secretions and Evacuations consequent thereon, must occasion a Waste, which must be restored and replenished out of what we eat and drink ; being first so changed, by the common Actions of Life and Health, as to become similar to the Fluids and Solids, from whence the Waste was made, otherwise Strength will be impaired ; therefore, if this Change is not perfected, the nutritious Matter will acquire a depraved Disposition, and be unfit for nourishing. This depraved Disposition may happen, either from the Quality of the Aliments taken in, or from a Fault in the Vessels which are to concoct it, or their Inability to change it ; or, when changed, to apply it where wanted, supposing
their

their Ability to elaborate it. I will here say nothing of the Quality of the Food fit for Nutrition. Every one, I suppose, that frequents these Wells, has it in his Power to take that which suits best with his Constitution : Nor will I take upon me to prove how much Meats that are hard of Digestion, as Peas, dried Flesh, &c. are unfit for this Purpose ; the Reason is obvious ; but tho' the very best Nourishment is taken in, yet the Stomach may be so relaxed, as not to be able to reduce it into good Chyle, or digest it. A certain determinate Force is required in that Organ, and in the others subservient thereto, as the salival Glands. But besides the Saliva, it is soon afterwards mixt with other Humours, as the Bile from the Liver, pancreatic Juice from the Sweetbread, &c. Now if the Force or Strength of any of these is impaired, or weakened, their Actions upon the contained Fluids will be lessened ; hence they will not be sufficiently prepared ; hence a Lentor or Viscidity, and the Impulse of the Fluids against the secretory Ducts, will be languid ; hence no Secretion ; hence a Defect of something requisite to perfect Digestion ; and from a Lentor in the Juices, and a Diminution of their Secretions, an Obstruction in the principal

cipal Part of the Organ will be formed. Ingenious Anatomists have again discovered, that the Chyle mixes with the venal Blood, and circulates along with it, for the Space of between eight or ten Hours, or more, before it perfectly assimilates therewith; and how, by Degrees, by the Force of repeated Circulations, and the Action of the Vessels thereon, it acquires the State of Bood. Now it is evident, if the Circulation is languid, or the contractile Force of the Vessels is weakened, a complete Assimilation cannot be made; and of Consequence there will be no Nutrition. For Parts must be supplied by Parts similar to those from which the Waste was made, *i. e.* by our own Humours, perfectly assimilated into our own Nature; which, as they circulate through their proper Channels, stop, adhere, and fill up the Vacuities. Hence comes the Necessity of that plastic Quality, observable in the Blood, Serum, and its Excretions, that it may become sufficiently adhesive. If the Juices therefore are too thin, then they are unfit for Nutrition; or, if too thick, they can't pervade the Vessels, through which they are required to circulate. If too acrid, they will be more apt to cause an Attrition from the Parts, than to give Recruits thereto:

thereto : Yet a certain Acrimony perhaps is requisite, as well as the Action of the Solids, to keep them in a due Degree of Fluidity. It is obvious, that the Vessels must be pervious ; hence obstructed Habits are but ill nourished : But then, notwithstanding the Vessels are pervious, and the nutritive Matter, both as to Quantity and Quality, sufficient and good ; yet, if the Force that carried it be either too strong, or too weak, the Body will not be nourished. If too weak, it either will not reach, or be applied to the Parts, from whence the Waste was made, with sufficient Force to adhere thereto : The Body will be filled with Humours, because the Vessels being lax and feeble, and the Circulation languid, the Secretions will be diminished, and what ought to be expelled will be retained. On the other hand, if the Circulation is too rapid, the stronger will be the Attrition against the Solids ; more will be worn away, nor will a sufficient Time be allowed for the nutritive Matter to adhere to the Place where wanted : Hence the Reason, why a fat, corpulent Man becomes quite emaciated in a Fever. But when it happens through Rigidity, or a rapid Circulation, Recourse must not be had to these Waters. I will say nothing here of that Con-

F

sumption

sumption caused by internal Ulcers, whether seated in the Lungs or Viscera; nor of that which happens after Falls or Bruises; or from an Obstruction of some natural Evacuation; since the first is caused by an Obstruction in the Part affected; again, an Obstruction is occasioned by the Bruise; and, lastly, an Obstruction, and weakened Vessels, are either subsequent or antecedent to the Stoppage of some natural Evacuation. Physiologists have proved, that when the Aliment taken in is not perfectly assimilated into our Nature; when it is not sufficiently concocted and digested into good Chyle in the Stomach and Bowels; or when the Vessels want Force farther to attenuate that Chyle, and form it into good Blood by repeated Circulations; the Vessels which constitute the human Frame, must be weakened from violent Hæmorrhages happening upon Wounds, Floodings, or Miscarriages; or other great and supernatural Evacuations precede the same: Living long in a moist Air, and upon watery glutinous Food, disposes the Body to the same Calamity. A Stoppage of some natural Evacuation, if the Humour retained is not thrown off by some other Outlet, must cause a Plenitude; which Plenitude must distend the Vessels beyond their usual

Dimen-

Dimensions, and cause Debility : As the Urine, if it is too long, and in too great a Quantity, retained in the Bladder, stretches its Fibres so far, that they lose their Power to contract and expel it. Now if the Vessels and Viscera are, by any of these Means, weakened, their Action upon the contained Fluids will be in Proportion lessened ; and in Proportion as that is lessened, the Fluids must lose in their Motion ; particularly those which are contained in the Veins and lymphatic Vessels, not only on Account of their great Distance from the Heart, but because they are driven back thither, partly by the same Force or Motion, that was communicated to them by the Arteries : Hence it is, that the Veins, in most Places, lie contiguous to the Arteries ; that the latter, when full, and in their Diastole, may press upon the Veins, and assist the Motion of their Contents ; for the Veins have neither Systole nor Diastole ; that is, beat not. I said, that the venal Humours were driven back to the Heart, partly by the same Motion given them by the Arteries ; for the Muscles, when in Action, swell, press upon the Veins, greatly aid that Motion, and forward the Return of their contained Fluids : But if the Vessels are debilitated ; if the Action of the Heart and

Arteries is abated; if the muscular Force grows languid; those Aids become wanting; and the Blood, which is thrown into the Veins, by the Contractions of the Arteries, can't be taken up. For the great ones slowly and with Difficulty empty themselves; and the small Lymphatics, finding these almost full, cannot pour in all the Contents they receive from their respective Arteries; hence, growing turgid, they break; or their Mouths become so dilated, that they suffer the Serum, or watery Part of the Blood (which it is their Office to carry) to escape into the adipose Cells or Fat, which lies betwixt the Skin and Flesh; and thus constitute, that Species of Dropsy we call an *Anasarca*; in which the Legs and Feet first grow œdematous, receive and retain the Impression of the Finger; or pit, or swell, particularly after standing long, or suffering them to hang in a pendular Posture. For the Humours, when out of their proper Channels, cannot ascend contrary to the Nisus of Gravity; but in the Night, after remaining some Time in Bed, the Lymph ascends, and swells the Face, on account of the horizontal Situation of the Body. If the Impediment to the Circulation of the Lymph, be either in the Lymphatics of the transversal Muscles of the Abdomen,

Abdomen, or the Peritonæum, the Water escapes either into its Duplicature, or betwixt the abdominal Muscles and Peritonæum; or if in the Viscera of the lower Belly, it falls into the Cavity of the Abdomen; and thus constitutes a different Species of the Dropsy, called *Ascites*, according to the different Place wherein the Water is lodged. The same may be said of the Breast and Joints. It has been remarked by Physiologists, that innumerable Things dispose our Fibres to Laxity or Feebleness; which if I should proceed to reckon up, and give the *Rationale*, how such an Indisposition is brought on, I should be led into too large a Field. I have already given a Sketch of such a Theory; and I think I need not prove, that if our Vessels, which carry and propel our Fluids, be weakened, they will be unable to divide and thin them. The Thing is obvious enough: For our Blood, by Stagnation, will become concreted; as is evident when it is let out into a Porringer. But besides a Laxity of the Vessels, and a Defect of Motion, there are a great many other Things which dispose our Humours to a Coagulum; as has been proved by Experiments made by innumerable Authors. Hence, if the Blood be not sufficiently agitated and attenuated by
the

the Action of the Vessels, it becomes viscid ; or when render'd viscid from any other Cause it is disposed to stagnate. That this should happen so frequently in the Liver, is not to be wondered at ; for whoever considers how slowly the Blood, being venal, is moved thro' the Liver, out of the great Trunk of the *Vena Porta*, when the contractile Force of the Heart and Arteries are deficient, and wanting as Aids to propel it forwards, will see the Cause of such frequent and obstinate chronic Obstructions in that large Viscus. Besides, the Bile has the same natural Propensity to Cohesion ; for its watery Parts being exhaled, and its earthy ones uniting with the oleous, a perfect Pitch-like tenacious Substance is formed. Nay Bile, preserved in the Gall Bladder, will go into stony Concretions. Now the Extremities of the bilious Ducts being obstructed, and the hepatic Bile being thinner than Blood, it will easily retrocede, and escape into the *Vena Cava* ; and so be carried into the Mass of Blood. I conceive it indeed difficult for those bilious Tubes to become obstructed ; because they are, as so many inverted Cones, narrow at their Origin, but increasing in Circumference or Dimensions the farther they are extended ; but near their Entrance into the common Duct,

to pass into the Gut called Duodenum, their Diameters become contracted, or the Width of the Passage is lessened. Now certain it is, that whatever hinders the Bile from flowing into the Intestines, by contracting or blocking up the Cavity of the hepatic and cystic Duct, will occasion a Reflux of the Bile into the *Vena Cava*, and produce a Jaundice; whether it be from Concretions therein situated; or by a Pressure of those Canals *ab aliunde*; or from too great a Lensor or Viscidity in the Bile itself. If the Bile, again, is not secreted from the Fluids of the *Vena Porta*, the Blood will be affected with a bilious Cachymy, or a Redundance of that Humour. Why the Reflux of Bile into the Blood should occasion a Jaundice, or that pathognomonic or inseparate Sign, a discolouring of the Skin, particularly of the Whites of the Eyes, no one can be at a Loss to know. For the Skin receives its Tincture or Hue from other Juices; and the Bile, being of a saponaceous Nature, is easily dissolved with the watery Part of our Blood, circulates therewith, and moves along those Vessels, which admit not of red Blood; but the *Tunica adnata*, or common Covering of the Eye, is a very thin Membrane, thro' which the yellow Colour of the Bile is very

conspicuous. The secretory Vessels of the Kidnies are likewise so small, that they exclude red Blood; and the Urine, consisting only of its watery Part, with some Salt and Oil mixt therewith, is soon perceptibly tinged; but it being the Property of Bile to fuse the Blood, the whole Skin soon receives the yellow Colour. If this Siziness, this Lensor, or Viscidity should reside in the Serum of the Blood; then Rubs and Jars will be felt in the aponeurotic and membranous Parts, Ligaments of the Joints, and Tendons, like those of the Rheumatism; and if attended with a Fever and Inflammation, a real Rheumatism. By Stagnation our Juices again are known to putrify, corrupt and grow acrimonious; hence Corrosion of the Ligaments, carious Bones, &c. It is certain, that in these Cases other Compositions will be of little Service; because a Medicine is required consisting of extreme volatile Parts, of a penetrating Nature, capable of pervading the minutest Ducts, and of attacking the stagnating Juices in the inmost Recesses of their lurking Holes; and yet, at the same time, this Medicine must be so mild, and of so benign a Nature, as to be divested of all pungent Acrimony; its active Parts must be sheathed and enveloped by a soft diluting Vehicle, stored
with

with volatile mineral Principles. For the tender Fabric, debilitated Frame, and irritable Nerve, won't bear the Vellications of a rough Acid. But alas! such a one as I am speaking of is not to be found, amongst the Inventions or Productions of Art.

But Providence, it seems, has furnished us with such a Specific in these kinds of chalybeate Waters; and what the same all-ruling Power has denied us in the Pursuit of Art, he has given us here. For the volatile, ætherial, elastic Spirits are the very Remedies we want in these Cases; as they quickly pervade the smallest Passages; and introduce their own Vehicle, the Water, replete with Salts; the one to soften and dilute the obstructing Matter, the other to scour the Glands, and secretory Ducts from all Filth and Dregs; whilst, at the same time, the debilitated Frame, and relaxed Vessels are strengthened, by the chalybeate Contents; the Nerves exhilarated, and the Spirits raised by the ætherial ones.

In Disorders, of the same Nature, but proceeding from an opposite Cause, where the stagnant Matter is fizy, the Blood rich, and the elastic Force of the Vessels strong, these Waters will have a quite opposite Effect with their astringent Qualities; for by contracting
the

the Capacities of the Tubes, they rivet and fix the obstructing Matter in its Seat, instead of discharging it; and hence an innumerable Train of Disorders would be the fatal Consequences of taking them.

In all Disorders where this Water is beneficial, I must, once for all, recommend the drinking of it as near the Fountain-head as possible. For as the other Contents entirely depend upon the ætherial, volatile, elastic Spirits; when these are evaporated, no Success can reasonably be expected from them: Unless the purging Quality be the only Thing required, as in some gross Habits, where a Plenitude is only to be carried off.

Scorbutic Eruptions, that proceed from a Plenitude of the Serum, or watery Part of the Blood.

A Scurvy, of this kind, may very properly be deemed an Attempt or Effort of Nature to relieve herself of what oppresses her. For as this Plenitude proceeds from a Defect in the Secretions, especially that of Perspiration; and as this Defect in the Secretions proceeds from an Inability in the Solids, to carry the Juices with sufficient Force into the Mouths of the
excretory

excretory Ducts, or to divide and fit the Matter for Secretion ; so, whenever the Constitution, by any means, becomes invigorated, a proportional Quantity is thrown into the perspiratory Outlets ; yet either not being conveyed with sufficient Force, or being too viscid to pass, it there sticks, heats, becomes * acrimonious, and causes those Eruptions and Defædations of the Skin I am speaking of ; and what I think may not improperly be called a ferous scorbutic Plenitude.

In this Disorder, the Rock-Water is to be made use of preferable to any other. For the saline, scorbutic, or Pump-water would cool too much ; and by emptying the Vessels too fast, would reduce the Blood into its pristine State of Poverty. Besides, a Deobstruent is wanted to open the excretory Ducts, and clear the Skin, by attenuating the Matter which caused the Disorder ; so that, for more than one Reason, this Water, in this Case, is to be made Choice of,

* What I mean here by Acrimony, is that Matter which will inflame the Part affected, and cause a running Discharge, either of Water or Pus ; and not an acrimonious Salt ; because I am not as yet convinced, that either this Humour, or the arthritic Humour, to which I think this allied, contains any Salt at all.

All the scorbutic Disorders, which are incident to the common Sort, or poor People, who live mostly upon Vegetables, Milk, Cheese, and Salt Butter, are of this Class; and therefore this Rock-Water is, in a particular manner, to be recommended to them.

This Species of Scurvy is a kind of endemical Disease in these mountainous Countries. I have had many Cases of this Sort under my Hands; and have found them ever obstinate; which is greatly owing to the Patients themselves, who neglect the Means of Relief too long. The Medicine most in Vogue at present for it, is the Sea-water; but I have experienced the saline chalybeate Water far beyond it. One Thing I can't help remarking, which is, that the Patients never go for Relief, but in Summer, and by that means greatly neglect themselves; for many might be relieved in the Winter, as well as Summer; and the Winter Season would be more proper for some than the Summer.

The same obstructing peccant Matter, that causes this Species of Scurvy, causes also sometimes, and in some Constitutions, large Tumors, which discharge great Quantities of Ichor. These generally prove obstinate, and rebelliously resist the best surgical Endeavours; hence

hence they are frequently deemed scrophulous, or of the Evil-kind ; when in Reality they are no other, than long augmented and united Obstructions, proceeding from such a phlethoric ferous Diathesis, as I have been speaking of ; which, on a greater or lesser Exaltation of Blood, and Spirits, and Invigoration of the Constitution, either determine in this kind of Scurvy before spoken of, or in these last-mentioned Ulcers or Tetters ; in which, tho' they baffle the Skill of the Surgeon, as I have said above, yet this Rock-Water would be found beneficial ; and has signalized itself here, as well as in the Scurvy.

In all Ulcers or Tetters, which are suspected scrophulous, we ought to be very circumspect, and well assured of their Nature, lest we should pursue a wrong Method of Cure. To judge in this Case, we ought to examine into every Incident of the Patient's Life ; weigh his Temperament ; nor neglect that of his Ancestors ; but make ourselves acquainted with the Ailments each have been subject to. If they are not scrophulous, they will look more of a Carnate or Flesh-coloured Aspect ; the Bones will not be affected, not even the Periosteum, or Covering of the Bones ; the Pus, or rather the almost clear, limpid, watery
Matter

Matter will ferment with Acids ; which Symptoms are never to be met with in the *Scrofula*.

In weak Nerves.

All the Disorders we have been treating of, in the preceding Paragraphs, owe their Rise to weak Nerves ; yet as they do not exert their Tragedy immediately in that Part of the animal Oeconomy ; and as there are others, which do ; I chuse to place them under this Head. Such are convulsive Asthmas ; St. *Vitus's* Dance ; the hysteric Passion ; Tremblings. A Vertigo, again, is often caused by a Fault in the Nerves of the Head, or in those that have a Communication therewith ; nor is a continual Habit of catching Cold excluded from this Class ; 'tis owing to an enervated Constitution ; in which Acids relieve, or all such Things as brace the Nerves ; which argues, that such must be the best Preservatives.

The Cramp, spontaneous Lassitude, Pain in the Limbs, Trembling of the Extremities, and many others, are the Train of Disorders incident to weak Nerves ; in all which this Water, from its explained essential Properties, one may judge, will prove beneficial. For weak Nerves are always caused by Moisture ;
and

and the Matter, which weakens the Spring of the Fibres, and relaxes the nervous aponeuretic Parts of the human Machine, is most commonly the Humidity of some stagnating Fluid; which, if it is not the first Agent, acts as a secondary and auxiliary Cause; and must be discharged before the Tone of the Vessels can be restored, or there can be any Hopes of Recovery.

Most Asthmas proceed from the Weakness of the Lungs; from a relaxed State of the membranous Part of the Diaphragma, and Mediastinum; from either an impaired Force, or impeded Action, in the abdominal Muscles, in the pectoral, intercostal, and other Muscles serving to Respiration; from a Viscidity in the Juices; or else 'tis nervous. Let us but consider, that all Orders of Men in this great Metropolis, during the most busy Time of their Vocation, the Winter, breathe in two great a Plenty of moist, vapid, unelastic air. It is at this Season the Senator is engaged in his Country's Service; the Lawyer pleads the Cause of his Clients; the Priest is more fully engaged in his Functions; the Merchant quits the Country Air; the Shop-keeper is more confined; besides, in most of these different Employs, the Lungs, and Organs of the Breast,

Breast, not only have the greatest Strefs laid on them, but likewise are the first and most immediately affected by the Moisture, Pressure, and other Properties of the Atmosphere. So that it is no wonder we meet with so many asthmatic Complaints amongst all Conditions and Ranks of Men. And the same Reason that teaches us, that this is the Cause of their Complaint, will teach us, that *that* must be the fittest Remedy, which lubricates the Passages, attenuates and dilutes the affecting Matter, thins the Blood, discharges its excrementitious Qualities, and strengthens the Parts.

Palsies, that are caused by a general Resolution or Laxity of the whole Frame.

Altho' the original, and immediate Cause of Palsies, and the Doctrine about Vibration, or a Circulation thro' the Nerves, remains an undetermined Point in Physick ; yet, that there is a nervous Fluid, seems to me to be undoubtedly proved, by Dr. *Flemming* ; and I fairly confess, that I believe the Palsy is entirely owing to an Obstruction in that Fluid. For let us but consider, how violently all the maimed Members are affected ; how all Sensation, Motion, and Use is lost in them ; yet the Blood freely
circulates

circulates throughout, as the Warmth and Pulse indicate ; so that, I think, were the Obstructions, which cause this prodigious Effect, seated in the gross Blood-vessels, and not in those, thro' which the nervous Fluid passes, we should certainly find some Traces of it, and perceive, if not a total Obstruction, at least a very gross and visible Interruption in the Circulation of the Blood. I cannot therefore persuade myself, that the immediate Cause of this Disorder is seated in the Blood ; however, I will here determine nothing ; since it is agreed on all Hands, that a Palsy may ensue from a relaxed State of the Solids. But let it proceed from whatsoever Cause possible, the saline chalybeate Waters, that are endowed with Plenty of volatile, ætherial, elastic Spirits, for Ages past have signalized themselves as the most sovereign Remedies.

In Palsies, as well as Apoplexies, according to the present Practice, all manner of Evacu-ations are made Use of, and indeed not without Reason ; for when a Plenitude has the greatest Share in producing the Disorder, Evacu-ations must have the greatest Share as Remedies. *Contraria enim contrariis vincuntur.* But then, *Est modus in rebus.* There is a certain salutary Medium, beyond which we should

not pass, and yet should reach ; which exactly to hit upon is difficult, and precarious, tho' managed and regulated by the most skilful Hand. If we over-do it, Weakness, of several kinds, will be the Consequence ; for the animal Juices being too much wasted, the Remainder becomes viscid, and stagnant ; and by Stagnation a mucous Matter is generated ; which it is incumbent on us to discharge, before we can securely strengthen the Vessels.

In an Epilepsy, where the usual Remedies prove ineffectual, we may take it for granted, that the whole, or greatest Part, of the vascular System is choaked, or clogged with the morbid Matter ; wherefore Remedies are required to penetrate the inmost Recesses of the human Body ; but as yet we have not been able to obtain such by Art ; we must therefore have Recourse to Nature and her Productions.

In Agues, where the Bark proves ineffectual.

In these Cases we may certainly attribute the Bark's Failure not so much to the extreme Weakness of the Solids, as to large Obstructions seated in the Omentum, Pancreas, or Mesentery, and other Viscera ; which, in this Case, are over-loaded with a tenacious, or
purulent

purulent viscid Matter, of a blackish Cast, such being seen frequently pumped up by Vomits. The certain unerring Sign of it, is great Uneasiness and Distention of the Hypochondria. This Matter, and the Weakness of the Solids, prevents the due Maceration and Concoction of the Bark in the digestive Organs; and thus a Load is added to a Load, and a Weight to the Viscera, which are already overburthened; and if the Use of the Bark is persisted in, a hectic Fever is almost the certain Consequence, and a Dropsy the final Period: Nay, should the Bark be given liquid and digested, the distending Force of the obstructing Matter will hinder its contracting Power. We therefore lie under an indispensable Obligation to make use of such Remedies as are aperitive, as well as astringent; and as we cannot but acknowledge the imperfect Art of chemical Pharmacy, we must have Recourse to Nature's Alembic.

Debility after Fevers is very common in these northern Climates; and sometimes brought on either by unskilful Evacuations, or by a Neglect in purging off the morbid Matter; which lays a Foundation for innumerable Disorders, that, if tampered with, oftentimes prove dangerous: But this Remedy,

out of Nature's Dispensatory, has legitimated itself, as safe and effectual.

In Disorders of Women ; such as are incident to them from an undue Regulation of their monthly Courses.

Various are the Disorders, which are incident, in particular, to the fair Sex ; and most of them proceed from an undue Regulation of their monthly Courses : This is the Source of their chief Calamities ; these, whether partially suppressed, or totally obstructed, are the *Scylla* and *Charybdis* where most of the Sex suffer Shipwreck. By their Suppression a Foundation is laid for innumerable Disorders ; such as Fevers, Inflammations, Cholics, excruciating Head-achs, Hysterics, Inflation of the Stomach and Bowels, Distention of the Hypochondria, Defædations of the Skin, Eruptions, Flushing, Redness of the Face, &c. Their immoderate Flux causes great Debility, Loss of Appetite, Indigestions, Rumbling in the Bowels, Pain and Weakness in the Back, Loins, and Hips, Dropsy, Atrophy, *Fluor albus*, and many others too tedious here to enumerate.

It is not long since these Waters were used in an immoderate Flux of the Menfes. *Stabl* was the first, who, in a singular emphatic manner, recommended them for this Purpose; and was the first Physician that obliged the World with the *Rationale* of the Thing: 'Tho' the Practice indeed had before stood confirmed by a Series of Experiments published by *Henricus ab Her. Hoffman* has recorded this *Rationale*, in his Treatise on mineral Waters, where * he goes on thus.

“ The Reason why Physicians forbid Waters in these Cases (*meaning in violent Fluxes of the Menfes and Hæmorrhoids*) depends upon a false Notion of the Causes of such Discharges, and of the Ingredients of the Waters; which they take to be metallic, vitriolic, and styptic. For having found, by Experience, that Astringents are prejudicial in such Cases, they have forbid both the Use of hot and cold Baths therein. But as a Knowledge of the Blood's Circulation discovers the true Cause of these Discharges; and as the Apprehension of Styptic Ingredients in mineral Waters is groundless; this Opinion of theirs must be reject-

* Pag. 117, and 18.

“ ed as frivolous. A careful Enquiry into the
“ Cause of violent Hæmorrhages, shews it to
“ be no other than an Obstruction to the free
“ Circulation of the Blood, in certain Parts
“ of the Body. And thus the Blood having
“ not its due Motion thro’ the Canals, im-
“ pacted Matters are, of Consequence, gene-
“ rated in the Viscera, and the Obstructions
“ necessarily rendered greater: Whence the
“ Blood, coming to these obstructed Parts,
“ in a still greater Quantity, and finding no
“ Passage, of course diverts, and breaks its
“ Way through other Parts, where it has ei-
“ ther been accustomed to find Vent, or meets
“ with the least Resistance; whence it hap-
“ pens to be discharged with Violence in the
“ Parts above-mentioned. The first rational
“ Intention therefore, in the Cure of these
“ Disorders, is to open the Obstructions of
“ the Viscera, and to restore a free Circu-
“ lation of the Blood therein. And this can
“ no other Way be so effectually done, as by
“ drinking of Waters impregnated with a gen-
“ tle stimulating Salt. For it is the Property
“ of these Waters, by the large Quantity of
“ their aqueous Parts, to dilute and thin the
“ stagnating Humours, and render them fit
“ for Motion; whilst, by their saline Parti-
“ cles,

“cles, they dissolve the Viscidities; twitch
“and shake the Canals; and cause them to
“press, protrude, and squeeze forward their
“Contents.”

A Series of Trials, and the Success that has attended common Practice, in a Number of Years, have warranted and confirmed the Use of these Waters, in an Obstruction or Suppression of the Menfes; for the *Rationale* of which the World stands also indebted to that most ingenious Chemist, and renowned Physician, just before quoted; as may be seen in his Treatise on mineral Waters; whose Theory stands thus*.

“And as these Waters have an extraordinary Efficacy in the Stopping of Hæmorrhages; their Virtue is no less considerable in a Suppression thereof: A Truth that can be questioned by none, but such as have never attended at the Wells. For since a Stoppage of these natural and critical Discharges of the Blood, proceeds entirely from an Obstruction or spasmodic Contraction of the Vessels, thro’ which it uses to run; mineral Waters are wonderfully adapted to restore and promote these Discharges; it

* Pag. 119.

“ being the Property of such Waters to flow
 “ to the Extremities of the Blood-vessels, and
 “ there soften or attenuate the grosser Sub-
 “ stance that blocks up the Passages, and force
 “ it away by the elastic Property of their
 “ ætherial Spirit. And, at the same Time, by
 “ the large Quantity of their pure aqueous
 “ Part, they relax the hardened and contracted
 “ Fibres; and thus again open the accustom-
 “ ed Passage to the Blood.”

A *Fluor albus* is either caused by a Relax-
 ation of the Solids, or by an acrimonious State
 of the Juices; or by both conjointly. The
 first has for its antecedent Cause, whatever
 has a Power to bring on such a Disposition in
 the animal Fibre; as moist air; damp Beds,
 or Houses; an Obstruction of some natural
 Evacuation; a natural weak Constitution;
 Sickness, or an ill State of Health; the sink-
 ing Passions of the Mind, such as Fear, Grief,
 or Love; immoderate Venery; difficult or
 hard Labours; Floodings, venereal Gleets, an
 immoderate Use of purging Medicines, &c.
 The second is caused by whatever will bring
 on an acrid State of Blood; as Disorders that
 rob it of its soft diluting watery Vehicle; ex-
 cessive Heats; poignant Sauces; fiery Liquors;
 a scorbutic or venereal Taint, &c. They
 both

both have their Seat, either in the Canals of the Uterus, or in the Glands inserted in the Vagina. The Disease is obvious, when present; and its different Species are to be distinguished from each other by the preceding Causes, Quality of the Matter, and concomitant Symptoms. The latter, or the acrid Discharge, is attended with Heat, Pain, Excoriation of the Cuticle, and an ulcerated State of the Glands. The first is exempt from all these excruciating Symptoms; but brings on great Debility; occasions Pain and Weakness in the Back and Loins; causes Flatulencies, rising of the Hypochondria; the hysteric Passion, &c. Let us now see how these Waters are adapted to cure these two different Species of the same Disease. They, as Water, prove a fit Menstruum to dilute, weaken and dissolve the acrimonious Salts; their balsamic Parts tend to sheath, and envelope them; and both together are aptly disposed to soften the callous, hard, and indurated Glands; the ætherial Spirits invigorate the animal Oeconomy to fling off the peccant Matter, through some proper Emunctory, being first attenuated by the raised Force and Action of the Solids, and further divided by the mineral Principles; the Salts scour and deterge their Glands; their
balsamic

balsamic Parts consolidate them ; the vitriolic ferruginous ones strengthen and corroborate them : In fine, the Secretions and Excretions being perfected, a balmy Disposition of Blood is brought on, and Health restored.

The hysteric Passion is a *Proteus*-like Disease ; and includes a large Train of Symptoms ; and those very dreadful ones. Yet it is a Disorder too much slighted, and often ridiculed by those, that cannot account for its perplexing Symptoms. The poor Sufferer is frequently deemed whimsical, fantastical, and often censured with the opprobrious Appellation of ill-natur'd : It were to be wish'd it was so, and that the Paroxysms depended upon their Will, and Temper ; but the Case stands far otherwise. I have often been surpris'd, that any one can behold these amiable Beings, this lovely and most desirable Part of the Creation, tortured, racked, convulsed and almost agonizing, and not be struck with terror and Compassion ; such certainly must be divested of all Humanity. The Disease is a real one ; and the Objects merit our utmost Efforts to relieve them, and subdue their Foe. It is of the convulsive Tribe ; not an Affection of the Womb simply, as the Name implies, but a general one of the whole human Fabric ;

bric; though the Organs of the upper and lower Belly are chiefly and most commonly affected; as the Gullet, Stomach, Intestines, Liver, Spleen, Pancreas, Mesentery, and Uterus: But the Head, and the nervous and muscular Parts of the Body participate of the Evil. In all which there appear various Phænomena, according to the various Functions, Offices, and Uses, such Parts are destined to serve. The Disease is owing to a Lentor in the Fluids, and a certain easily moveable Disposition in the Frame; *genus quoddam irritabile*, and has, for its antecedent Cause, a Relaxation of the Solids, together with whatever will bring on such a State in the Fluids; amongst which, Inactivity of the Body, the oppressing Passions of the Mind, and a Suppression of some natural Evacuation have the greatest Share. The Paroxysm, or Fit, I deem an Effort of Nature to attenuate the Humours, open a free Circulation through the Canals, and sling off what oppresses her; hence if the Lentor or Surcharge of Humours is lodged, either in the Cavity of the Stomach, or Bowels, or situated in their Glands or Containing-Canals, those Organs become primarily affected; and draw in others by Consent of
 Parts,

Parts. Hence arise Inflations of the Viscera, Murmurings, Croaking, Catterwauling, Conflicts, spasmodic Constrictions, Rising in the Throat, &c.

If the *Fomes morbi* is flung upon the Uterus; or its secretory and excretory Vessels are obstructed; there begins the Tragedy. For, as the Use of the Spleen seems to be to thin the Fluids, to protrude them into the splenic Vein, or prepare them in its own Cells for the Office of the Liver, and Secretion of the Bile; if it there stagnates, it distends that soft Viscus, and encreases it into an enormous Size; and so of the rest. The Convulsions, Beating in the Head, &c. are so many united Forces to propel the Enemy, and divide the morbid Matter, and fit it for Expulsion. In this Action all Nature exerts herself; the animal Spirits are put into violent Motion; and, inordinately rushing in where the Stimulus is excited, excite still a greater. Hence some Parts become deprived of their usual Supply; and, from this inordinate and greater Influx into others, those Muscles become contracted, and convulsed, where the greater Influx is made. Hence ridiculous gestures, &c. There will be the greatest Influx where the Stimulus is greatest;

as is evident from Inflammations in the external Parts, and from Experiments; as, vellelicate the Heart of a Frog, which is a Muscle, and you'll see it convulsed; prick its Guts, you'll see their Contractions, and natural Peristaltic, as well as præternatural Motions. But nothing proves this more manifestly than the Beating of the Dura Mater; which is so strong in some hysteric Patients, that it may be heard and felt; and which acts upon the Brain and nervous Fluid what the Heart does upon the Blood. Those who have a Mind to be farther instructed in this Matter, may consult *Bellini de Stimulis* and other Authors. Nor let those quarrel with this our Theory, who deny the Circulation of a nervous Fluid; and maintain Vibration only as the Cause of Motion. That Point shall not be disputed here. It is enough for our present Purpose, if, upon an excited Stimulus, the Vibrations of the Dura Mater and Nerves are raised (whether there be a Circulation thro' them or otherwise) as is evident, from the raised Contractions of the Dura Mater, consequent upon an excited Stimulus. For what is the Cause of natural Motion, must, if multiplied and augmented, be the Cause of a præternatural one——But I have dipt farther into Theory
than

than I at first intended : For it was not my Design to Philosophize, but to instruct the Ignorant, when and how to use these Waters ; and to give the Physician, whose Notice they may have escaped, some Analysis of them ; that for the future they may not pass unregarded. We have observed, that a Lensor in the Fluids and a Surcharge of Humours upon the Viscera, are the Cause of the hysteric Passion. The watery Vehicle therefore will serve to dilute it ; the Saline to attenuate and discharge it : And as no Part can be overstretched, or overloaded, without being weakened, the chalybeate Contents will strengthen ; and, by that Means, prevent a Return of the Fits.

In all Kinds of Obstructions, wheresoever seated, as well as in a Debility of any particular Part, this Rock-Water is an excellent Remedy. But to enumerate all Disorders consequent thereon, or those incident to the fair Sex in particular, would swell this Treatise into too large a Bulk.

Seminal Weakness is too frequent in both Sexes. The Causes are various and innumerable. But there is one more fashionable than the rest ; which our Ancestors, indeed, were almost Strangers to ; I mean the Venereal Disease.

ease. This, when treated by the Unskilful, weakens some Patients ; makes others old before their Time ; destroys innumerable Families ; and renders many more miserable, both in themselves and their puny Posterity. But let such as have seen the Folly of entrusting their Health to the Ignorant, and have any Regard for themselves and Posterity, dilute, wash away, and purge off, what they may have contracted, either by Medicine or Disease, and brace up their flabby weak Muscles again, with the saline chalybeate Waters : Among which, as the *Llandrindod* Rock-Water has an equal, if not a superior Merit to most, on account of the Salts, and those of various Sorts, which enter its Composition ; I cannot help recommending it, in Preference to any other.

In Diseases that depend not upon a debilitated Frame, I should be unwilling to recommend this Water. Where there is a tense Fibre ; dense, rich Blood ; or in Constitutions, that are otherwise distinguished with the Epithets hot, adust, or bilious ; it will certainly prove prejudicial. For as by stretching the String of a Fiddle too much you will probably break it ; so, from over-bracing the Fibres

bres of the human Body, dangerous Consequences will ensue.

The same Caution is necessary with regard to Age: For it is not a fit Medicine at all Times, and Stages of Life. Let us but consider that the longer we live, the fewer Blood-vessels we retain in our Bodies; and that the Fibres become stiff, and loose in their Spring or Force, so as to be unable, from their too great Rigidity, to give sufficient Motion to the Juices. This Stiffness would be increased by the cohesive contracting Power of the chalybeate Contents. We may therefore conclude (Allowances being made for the Difference of Temperaments) that this Water is utterly to be avoided after 50 or 60 Years of Age.

C H A P. III.

*Proper Directions for the medical Use of the
Rock-Water at Llandrindod.*

EVERY one who has been at the Place has seen, and heard it regretted, how much proper Directions for the physical Use of this salubrious Fountain were wanted. And as the fatal Consequences, which almost annually result from the preposterous Methods, pursued

pursued in drinking of it, have made something of this Nature much wished for ; I was induced to think that an Undertaking, of this kind, would not fail to be kindly accepted.

One great Error, which I observed, was drinking it in immoderate Quantities. Numbers come there, straiten'd in Time ; who, for the Sake of Dispatch, and that they may return to their respective Business, swallow it down in excessive Draughts, instead of taking it with Discretion as a Medicine. The Works of all Physicians of Note, that have been wrote on mineral Waters, are full of dreadful Cases, containing the fatal Effects, that have ensued the indiscreet Use of them. It is therefore surprising, that Volumes have not been written, or, at least, that there are not popular Traditions enough to fill whole Volumes with Histories of the like Nature, with regard to the Waters of *Llandrindod* : And yet we find it otherwise ; and that they have but few Instances. Now, not to refer the Cause of this to a particular Act of Providence, as I have done elsewhere ; as if the Deity, in order to establish the Fame and Reputation of these Waters, has miraculously protected thousands, there must be some natural Causes of these

wonderful Escapes, wheresoever such Causes may exist; perhaps in the Air, and the Water itself. The Air is thin, light and pure; which Qualities greatly dispose the human Frame for its Reception; and are strong Means, as Physiology demonstrates, to restore a free Circulation of Blood, and, consequently, to promote an uninterrupted, free Discharge of the peccant Matter, as well as the Medicine. The Water, again, is replete with an ætherial, volatile, elastic Spirit; which renders it light; besides, this Spirit is of an exceeding penetrating Nature; its chalybeate Contents are finely ground; its Salts so intimately mixt, and so judiciously blended, that the whole constitutes the most benign Medicine; which, from the Fineness or Subtlety of its Parts, is so pervading, that the Obstruction must be very great to resist it. Besides the Purity of the Air of *Llandrindod*, this Minuteness of Elements or Contents, this Store of volatile, ætherial, elastic Spirits is to be met with in few other Spaws; hence the ill Effects so common to others are so rare here. If these my Reasons should not appear satisfactory, I must acquiesce; for I frankly own, if these are not the real ones, I know not where to find them. To imagine, that the Inhabitants could,

or

or would, conceal the pernicious Consequences, through Fear of bringing the Water into Disrepute, would, I fear, be a Supposition too much bordering on Uncharitableness and Ill-nature.

Since the Experience of Years past has made it manifest, that this Spaw has done great Service in many, and those inveterate, Disorders, even under an improper Management ; what then might be expected from it under proper Regulations, and Restrictions ? Let us therefore proceed to give some general ones.

As they who resort to these Springs are generally fatigued by the Journey, more or less, according to the Distance of the Place they come from ; this, and all other Circumstances, should be duly weighed ; and every previous Caution should be used by the Patient, and his Director, before he commences drinking the Waters.

In order to obtain the Benefits we expect to reap from the Use of this Spaw, and to guard against the Dangers and ill Consequences, that may ensue from an Abuse thereof, I will endeavour to lay down the properest Method to be observed in using it ; and, for the Sake of Perspicuity, will divide these medical Directions under the following distinct Heads ;

after having premised, that such Directions will, after all, fall very short of Perfection.

General Rules may be given ; but they are liable to innumerable Exceptions ; and that they should suit all Cases, Circumstances, and Occasions, is not to be expected.

First, Necessary Preparations, which ought to precede a Course of Drinking the Rock-Water.

Secondly, In what Manner we ought to enter upon the Course ; and under what Regulations and Restrictions.

Thirdly, How to proceed in any Revolution, or accidental Disorder, that may happen whilst under the Course.

Fourthly, What Management is required after the Course is completed.

Fifthly, What Regard is to be paid to After-effects, or Consequences which sometimes ensue in Process of Time ; and what Regulations are to be observed therein.

1. *Of the necessary Preparations, which ought to precede a Course of Drinking the Rock-Water.*

One would think, that no one would venture, upon his own Judgment, to make Use
of

of this Water, unless it be in a simple Weakness ; or in such Distempers as are dependent thereon, without a Complication with any other Disease : Every Patient, perhaps, may be a sufficient Judge himself when a due Cohesion of the Elements of the Fibres is wanted ; at least, he may feel himself weakened, and know that the Intention of Cure must be, to bring those Elements into closer Contact ; to restore a just Rigidity and Firmness to the Solids, and to give the Fibre a proper Elasticity. In these Circumstances, therefore, a Man may be allowed perhaps to proceed upon his own Judgment, without Hesitation ; if there be a Necessity for it. But, even in this Case, it would be better, that he consulted a Physician ; and such a Physician as might be reasonably supposed acquainted with the Qualities of the Waters, and able to regulate their Use, according to his Patient's Constitution.

Let no one think, that this is to lead the Patient into unnecessary Expences ; which may have been sufficiently enhanced already by Sicknefs, the Journey, and other Preparations. Since, according to my Notion of a true Physician, one who is capable of acting up to the Dignity of the Character ; he ought

to be endowed with all imaginable Tenderness; with a certain Generosity or Nobleness of Soul, which will carry him above mean Actions. He ought to be so compassionate, as to have a Fellow-Feeling, and participate of every Affliction his Patient is troubled with. Such a Sense will extort Advice, and force him to give his Counsel, *Gratis*, to every indigent Complainant. He will even seek Occasion to oblige those, that have a Spirit to appear genteel in narrow Circumstances. It will afford him a greater pleasure to refuse his Fees from such, than to receive them from the most Opulent; and the same generous and humane Disposition, will make him conceal the Objects of his Generosity.

The Patient's own Observations are by no means to be disregarded; for every one, that has some Time laboured under any chronic Disease, is, in some Measure, a Judge of his own Case, particularly of such Things as agree or disagree with him, called by Physicians *Juvantia* and *Lædentia*; which, together with every other Article he can recollect, appertaining to himself, he ought to impart to the Physician he consults, so as to enable him to form a just Diagnostic, or a true Idea of his Disease; but as to fixing, settling, and regu-

regulating the Course he enters upon, both in respect to the Method to be pursued, and the Duration of it, this must entirely be left to the Determination of the Physician ; who is to take his Indications from the Nature of the Disease, to which alone he must apply his Attention, listening as little as may be to the Patient's own Will, or Opinion ; who may be too apt to extort a Concession, to his own Detriment, as well as the discredit of the Physician and Waters ; that such and such a Space of Time will be sufficient.

Going for Relief to these Waters ought never to be delayed. Whether it be early in the Spring, the Dog-days, or Autumn, it matters not, if the Case requires it. The Influence of the Planets, as I have already observed in the Introduction, can have no bad Effect on the Atmosphere of *Llandrindod* ; which is so happily elevated, that neither a scorching Heat, nor piercing Cold, can interrupt or spoil its Temperature ; being always pure, it is ever assisting these Waters in their salutary Operations and Effects : Therefore the latter End of the Year, as far as the Middle of *November*, is not too late for a Course, if the Exigence of the Case or Necessity demands their Aid.

These Preliminaries being thus settled, the next Thing, that comes under our Consideration, is, whether the Patient ought to lose Blood or not. If it should be thought requisite, the Vein ought to be opened three or four Days before he enters upon his intended Course; and, unless something forbids it, the Day after his Arrival; because we may suppose the Blood, after the Journey, to be somewhat inflamed; in which State we may always expect greater Fruits from the Operation; because then the Circulation is more rapid, than in a State of Ease and Repose.

The Subjects fit for bleeding are, such as have a natural Tendency to generate rich Blood; such as are accustomed to high Feeding, or the Use of Cordials and spirituous Liquors to revive their drooping Spirits; and who lead an unactive sedentary Life. These last, in particular, have Occasion to lose Blood, and that in a sufficient Quantity, in order to make room for the Waters, disburthen the Viscera, and cause a more free and easy Circulation.

Where the Case is the reverse; where there is a Poverty of the Juices; where the *Vis Energiae* and texture of the Blood is destroyed,

stroyed, as it is in leucophlegmatic Habits, or in such as have a Tendency to the Dropsy, Bleeding must be omitted ; and in its stead must be substituted Purging with the saline Spring, commonly called the Pump-Water ; which, in this Case, must be taken upon an empty Stomach, at repeated Doses, in small Glasses, each Glass not containing more than a Quarter of a Pint ; to which a Tea Spoonful or two of Rum, Brandy, or Carmelite-water may be added. Five or six of these Potions must be swallowed in Bed, or in the Room, in the Space of two Hours, more or less, according as they operate, or in Proportion to the Idiosyncrasy of the Patient ; two or three purging Motions being sufficient. This Method must be persisted in, for the Space of three or four Days ; which will be a fit Preparation for a Course of the Rock-Water. But those with whom the Pump-Water does not agree, may take the Rock-Water, if they let it stand in an open Bottle for the Space of eight or ten Hours, that the chalybeate Contents may evaporate ; when it will prove a proper Purge, and answer the above-mentioned Purpose ; and may be taken by itself, or with Rum or Brandy, as ordered with the Pump-Water.

Experience

Experience has furnished the Republic of Physic with many Shop-Compositions, as fit Preparatives for a Course of chalybeate Waters : But as these are quite unnecessary at *Llandrindod*, where we have such Choice of these natural Evacuants, I will omit speaking of them ; especially, as I think these have greatly the Pre-eminence to any met with, even in our modern *Pharmacopæiæ*.

Bathing the Feet is of such Consequence, that, to some Habits, even that alone is an excellent Preparative : Indeed it ought not to be forgot or omitted during the whole Course of drinking the Water ; as it greatly revives and refreshes some sluggish spasmodic Habits ; gives the Blood a more free, easy, and uninterrupted Circulation ; adds some elastic Force to the Vessels, which they greatly stand in Need of ; causes a Revulsion ; relieves the Head ; empties the Hypochondria ; takes off those Oppressions, which a disturbed and uneven Circulation occasions, and which bring on those Terrors, those Anxieties, those frightful Dreams, and that oppressive Languor incident to some that labour under hypochondriacal Affections ; and, by making the Body easy, disposes to Sleep ; during which Time Perspiration, and the other animal

mal Functions, proceed regularly. Hence a Way is paved for the Waters ; which, without Interruption, oftentimes may enter upon their Office : And the mortal Fabrick is capacitated to receive what will correct and discharge the morbid Matter, by the secretory and excretory Ducts.

Since, by Experience, we are convinced, that bathing the Feet has this salutary Effect, we do not only recommend it as a Preparative before drinking this Water, but also as an Aid and Assistant during the whole Time of taking. As a Preparative, it is to be used three or four Evenings successively just before going to Bed ; and as an Assistant, about twice a Week. This Bath is no more than to make the saline Pump-Water hot, and to infuse into it some cephalic Herbs.

2. *In what manner we ought to enter upon the Course ; and under what Regulations and Restrictions.*

When the Patient is prepared, after the manner above laid down ; he may enter upon a Course of drinking the Waters ; which must be done at the Spring-head ; because the volatile chalybeate Contents exhale, almost

most as soon as taken out of the Spaw, and considerably lose their Efficacy, even by so short a Carriage, as the Space of 10 or 12 Yards : Therefore it is impossible to appoint any other Place than the Origin of the Fountain ; which neither the Inclemency of the Weather, nor any other Impediment, can make us dispense with.

I am well aware, that it will be here objected, that some weak, tender Constitutions, who resort thither for Relief, can hardly bear the Air ; much less Rain, if it should happen to fall. To this I answer, that if they will reap the full Fruit and Advantage, they may reasonably expect from the Water, they lie under an indispensable Necessity of running the Risque ; and therefore must guard against the Danger in the best manner they can, by warm Cloathing, by riding on Horse-back thither ; or if this they are not able to do, or it should prove too violent an Exercise for them, they may go in a Sedan, or in any other convenient Vehicle.

As to the Time of Day, the Morning is undoubtedly the most proper for drinking these Waters ; and that before Breakfast, from Six to Nine o' Clock, according as the Weather will permit. But as these kinds of Waters
are

are in their utmost Perfection before the Sun gains any great Ascendency, to exert its Influence ; I therefore would recommend them to be taken as early as possible ; even before Seven or Eight o' Clock, if the Patient can rise so early.

We should repair from our Lodging to the Spring with as much Ease as possible to ourselves, that we may be perfectly cool when we come thither. But there are some Patients so weak and feeble, that the least Motion throws them into a Sweat ; such therefore should be conveyed to the Place either in a Sedan, Coach, or on Horseback ; but as soon as their Strength encreases, gentle Walking will be, in every respect, preferable to a Vehicle ; because the Water not only tastes more agreeably after such Exercise ; but in this Motion, the Action of the Muscles presses upon the Blood-vessels and glandular Strainers ; whence we may promise ourselves a more successful, certain and prosperous Effect.

The Quantity taken, each Morning, ought never to exceed a Quart or three Pints ; and to this the Patient must ascend by Degrees. The Glasses should contain no more than one Quarter of a Pint ; so that one Quart may be taken in eight Glasses. The first Day, the
Patient

Patient should begin with three, and so add one every Day, till they amount to the Number eight ; which must be drank in the Space of two Hours, as has been already observed ; and before Breakfast. About an Hour before Dinner, it would not be amiss to visit the Fountain again, and take a Draught of the Water ; which ought never to exceed two Glasses ; and about Bed-time two Glasses more should be drank : But the chalybeate Contents of this nocturnal Dose should be suffered to evaporate ; as it is intended to keep the Body soluble.

This Method must be pursued, when the Intent is to use this Water as an Alterative ; and, with this Quantity, we suppose the Body in a perfect State, reaping the Benefit of natural Evacuations. Even in Habits, that are usually costive, we expect that two Stools should be procured in 24 Hours : But if the Secretions should be defective ; or if the just now limited Discharge happens not ; or if, in voiding the Excrements, there ensues a Heat in the *Intestinum Rectum*, or urinary Passages ; then half a Pint of the saline Pump-water must be drank first in the Morning ; and the same Quantity at Night going to Bed should be substituted instead of the Dose of Rock-Water,

Water, notwithstanding Care be taken to suffer all its chalybeate Contents to exhale.

To use this Water constantly, or too long as an Alterative, would be rash, and highly improper ; because the peccant Matter, which clogs the Nerves, and is incident to every lax Fibre, would, by the cohesive Power of the chalybeate Contents, become adherent, and fixt thereon : For which Reason an encreased Evacuation, to dislodge this burthensome Neighbour and Enemy, is now and then, perhaps once a Week, requisite. To answer this Purpose, I would advise the Patient to take three Pints, instead of a Quart ; or augment the Dose in Proportion to the Quantity usually drank ; and, as a Preparative to so large a Dose, to drink the preceding Night a Pint of the Rock-Water, after the chalybeate Contents are exhaled ; or as much of the Pump-water ; and thus, that Day, change the alterative Method into a purgative one. But as it is impossible to ascertain a just Dose, in this respect, to every Constitution, I would rather chuse to leave it to the Decision of the Physician who attends, and is consulted, to be adjusted according to the Idiosyncrasy of the Patient ; or it must be learnt by the Drinker's own Experience ; which will teach him to
increase

increase or diminish the Dose, and how to vary the Quantity, so as to make it either alterative or purgative.

I most earnestly entreat the Visitors not to venture upon too large a Dose. Such Rashness often has been, and so may be, attended with fatal Consequences. Every one knows it is much more easy to add, than to subtract; and what in one Day has been lost may be regained the next. To conclude that Water operates by its specific Gravity is a mistaken Notion. No Medicine in the World, not even the mechanic Physician's beloved Mercury, produces its Effect upon the human Body by its Gravity, much less our chalybeate Water; for the slightest Look into Anatomy will convince us, that we are not Clockwork, or such Machines, that have a peculiar Pendulum or Regulator to heighten or depress, and to govern our Movements by: No! The specific Gravity of a Fluid will avail nothing, if in the Stomach a Mixture or Maceration with its Juices ensues not. For Instance, if a chalybeate Water that is destitute of Salts, such as that of *Tunbridge* in *Kent*, is taken into the Stomach after the volatile chalybeate Contents are exhaled, it will then by no means agree with it; but proper
Medi-

Medicaments will be required to discharge it : Now, if the specific Gravity availed any thing, it ought to agree more readily, and prove more serviceable, because this Water, after the volatile Contents are fled off, becomes considerably heavier.

This Proof, being grounded upon an experimental and anatomical Basis, shews, that immoderate Quantities of Water must be highly detrimental, both to the large and small Vessels of the Viscera. For do but overload a close Vessel, or Barrel, with common Water ; and by Agitation, and a close Confinement of its Contents, you will cause it to burst. Can we then reasonably expect any other Effect from a Water, that is impregnated with elastic Spirits ; which on the slightest Agitation will break any Vessel, which it is contained in ? Therefore, by drinking too much, the very Intent of Relieving is frustrated ; for by overloading the small minute Vessels of our Bodies, we break, and destroy them ; and far greater Evils, and far more dangerous Consequences, are brought on, than those we endeavoured to remove. Again, it stands warranted upon the same certain Foundation, that smaller Doses of Water operate

I more

more speedily and securely than large ones ; because they can more easily insinuate themselves into the Capacities of the Fibres, and intermix with the Fluids, when gradually taken. I think there is an absolute Necessity of drinking this Water cold. For my Part, I fairly and ingenuously confess, I cannot hit upon any Method of giving it warm, and at the same Time of preserving its volatile, æthelial, mineral Spirits ; though I have attempted it in many Shapes ; therefore must content myself with advising every one, that consults his Welfare, to drink it cold. Such as are weak, lean, phlegmatic, and are subject to hypochondriac Disorders, whose Stomachs cold Liquors chil, should mix some Carmelite-water, Tincture of Orange Peel, Cardamons, or such like, or a little Rum and Brandy with it. These will make it agreeable to their Stomachs ; and its Use will so invigorate them, that they will soon become in a fit Condition to drink, and bear it with Ease, without any other Mixture.

In many Cases these Waters may be mixt with an equal Quantity of Milk ; by which they will, in a most eminent Manner, be improved in their Efficacy ; particularly in such Scurvies, and scrophulous Disorders, as I have

mentioned

mentioned in the former Chapter ; because the Milk here not only sweetens and corrects the acrimonious Juices, but also nourishes and enriches the Blood, and thus assists the medical Contents of the Water. *Hoffman* * has not only observed this Property, in these Cases, but has with equal Success administered it after the same Manner in the Gout.

Whatever is mixt with this Water must first be put into the Glass ; and the chalybeate Water must be received upon it. Thus, without losing any of its mineral and volatile Contents, an Union may be effected, which will appear intimate and smooth.

The Stomach is also to be assisted, if Occasion requires, with Lemon or Orange Peel candied ; with the Roots of Zedoary ; Calamus Aromaticus ; Elicampane ; Coriander ; Cardamon, or Caraway Seeds, &c. or their Tinctures ; which ought to be taken in the Intervals of the Morning Doses. But then great Caution is necessary in the using those which are candied, because Sugar, with these Waters, will cause Inflammations, and cutaneous Eruptions ; on which Account it must be sparingly used.

* *Hoffman*, Pag. 62.

These Waters also may be assisted with other medical Aids ; which, upon warranted Practice and Experience, have been found serviceable to many in chronic Diseases. But what in this Respect to advise, in a general Way, I know not : These Points must be left to the Determination of the Prescriber. To attempt even a Schedule of what would be proper for every individual Patient, and in every different Disease, would be dangerous ; since the utmost Caution is to be taken, not to make an improper or immoderate Use of Shop-compounds, in the Time of drinking these Waters.

These Waters should never be used without gentle Exercise betwixt each Draught. Those that are able should walk, and those that ride, must use a little of that Exercise ; and they that come in a Sedan, should order the Glasses to be opened, and be carried about for some Time, that they may breathe as much of the clear Air of *Llandrindod* as possible.

To determine how long a Course of these Waters is to be continued is impossible. That depends upon the Constitution, and the Nature of the Disorder. Some mend speedily ; others require a longer Time. However, this
is

is certain, that if the Water does no Service, it must disagree with the Constitution ; and therefore its Use should be discontinued. Of this, again, we may be equally certain, that if it agrees, or can be made to do so, we may safely continue its Use, and from thence expect to reap Advantage, altho', for some Space of Time, no apparent Amendment ensues : In which Case in particular, we cannot pretend to fix an exact Limit for its Continuance ; but must recommend Perseverance ; and the Person, that is so happy as to recover, will be sensible enough when to discontinue its Use.

Every one is acquainted with the old physical Precept to Patients ; that whatever Course of Physic is entered upon, they must indispensably regulate their Diet, and adapt it so, as to favour and second the Effect of the Medicine : But, above all, mineral Waters require a more particular and exact Regimen ; and Care should be taken that every Thing coincide therewith.

The Air is required to be serene, warm, and perfectly clear ; yet it ought constantly to fan and ventilate our Bodies. For the radiating Beams of that vast luminous Body the Sun would prove detrimental to us, if their

scorching Heat was not continually moderated and corrected by the cool, gentle, and temperate Breezes of a fine, thin, circulating Air. I have already related, in the Introduction of this Treatise, that the Air of *Llandrindod* is endowed with this excellent Medium, so necessary for those who drink these Waters.

In Eating and Drinking, two Rules are principally to be observed. First, never to eat too much at one Time ; and secondly, that the Aliments are good and nourishing. I would not be thought to exact here a strict Abstinence. I would only have it remarked, that he who observes the golden salutary Medium, who always takes as much, yet never more, than the Constitution requires, or cheerfully bears the Load of, will, *Cæteris paribus*, certainly receive the greatest Benefit, and most speedy Succour. Supper should never be taken later than Seven o' Clock ; and I intreat every one, who visits these Waters, to avoid Meat-suppers, which poison and corrupt the very Juices we endeavour to correct and amend.

The most simple Food is the most proper ; such as all kinds of fresh Meats, as well as Fish, dress'd plain : But, for Supper, Vegetables, Milk, and the like are preferable. As

to

to Liquors, Brandy or Rum mixt with Water, or Milk and Water, are the most suitable I can think of; tho' here I must submit to Custom, and give the Patient his own Choice, to make use of such Liquors as, by Experience, he has found best to agree with him; but, at the same Time, caution him not to deceive himself, and make Choice of those he likes best, instead of those, that are most suitable to his Constitution: Let the Kind be what it will, I must warn him by all Means, if he regards his Safety and Welfare, not to make an immoderate Use of it.

As it has been already observed, that the Exercise ought to be mild and gentle, so it ought never to be used too long, or sufficient to bring on Lassitude or Weariness. If, on the other hand, to prevent this, you intermit the Exercise, and have Recourse to Rest; that Rest ought not to be indulged so long, as to let the Body become cold or chilly. It is likewise necessary to have always, on cold moist Days, a Fire in the Long-room. Breathing Sweats are in some Cases or Disorders beneficial, nay requisite; but at this Distance I cannot pretend to time them; therefore must forewarn my Readers never to venture or attempt to promote them, unless under the spe-

cial Direction of a Physician ; that they may avoid the Danger, which might ensue from any such unseasonable Proceeding.

The volatile, ætherial, elastic Spirits most commonly cause or promote Sleep ; so that the Patients, who drink these Waters, are generally heavy and drowzy some Time after taking them. This Drowziness must by no Means be indulged, but shook off, and diverted by some Amusement or other, as by Dancing, Walking, or such Exercise, as the Weather, and Circumstances of the Patient will admit of. The same Rule must also be observed after Supper. For nothing is so pernicious, as to go immediately to Bed upon a full Stomach ; yet it is equally hurtful to set up too long.

The necessary Evacuations (as has been already elsewhere observed) are to be justly governed, and duly kept up, under a Course of mineral Waters. Therefore all Means, in Food, as well as Physic, ought to be used to cause such a Disposition of Body, to aid and assist Nature if sluggish, and check her if she overacts her Part. The Belly must always be kept soluble.

Our Passions ought to be regulated under all Courses of Physic, and the Mind kept easy
and

and serene: But in the Use of these Waters especially; because here the whole human Fabric is, as it were, washed and lubricated, the nervous System is pervaded, and the proper Undulations restored to every Fibrilla; so that the least Sensation of any Calamity, at this Time, will have the Effect of a most violent Shock, and throw the System into Spasms. It is therefore necessary to guard against all manner of Uneasiness, and to avoid every Thing that may discompose the Mind, if any Good is expected to accrue. I am very sensible, that here I may be interrupted; and be told, that what I require is altogether impossible. It will be asked, How can any one, who has the Good of his Family at Heart, be entirely void of Care and Concern? I grant, the Objection carries some Weight with it; but both our *Christian* and moral Duties step in here, and require it of us. For first, as *Christians*, we ought entirely to resign ourselves unto God's holy and blessed Will, and thankfully use those Means which he has allotted, and which we judge conducive to our Recovery; prudently considering, that if we neglect them, we are guilty of a kind of Self-murder; and that by our untimely End we do greater In-

jury

jury to those we are so much concerned for, and for whose Sake we ought to be desirous of preserving ourselves. When we have thus reasoned and composed ourselves as *Christians*, then let us proceed to our moral Duty, settle our temporal Concerns on as good a Footing as possible, so that in our Absence they may not be too much neglected; and then cheerfully repair to the Wells; drink the Waters regularly; partake of all the harmless Mirth, and pleasing Amusement, the Place affords. There all are gay, as it were in primitive Innocence, without Strife or Contention. Superiority and Distinction are, as far as consists with Decency and good Order, laid aside; and every Body, in as polite a manner as possible, or by good Nature, endeavours to be agreeable.

3. *How to proceed on any Revolution, or accidental Disorder, that may happen while under the Course.*

Corrupt Juices will not only sometimes cause a contrary or opposite Effect from a Medicine, than what was expected from its peculiar Nature, but will also sometimes cause preternatural ones; and this very often will happen in the Use of mineral Waters. For
Instance,

Instance, to vomit in the Beginning of drinking this Water is very common to those whose Stomachs are full of slimy Matter, or bilious Impurities ; and when this happens, it is adviseable, notwithstanding, to continue the Use of the Waters, to promote and pursue this Method of Discharge, in order to rid them of their Enemy, that noxious offensive Matter. This is to follow Nature's Dictates ; because this Water is not naturally emetic ; and this spontaneous Evacuation is oftentimes more beneficial, than one procured by Art.

In these Cases, the Vomiting continues most commonly three or four Days successively ; and returns, generally, every Morning, each Paroxysm being lighter and easier than the preceding. The Patient, by the Evacuation, gains an Acquisition of Strength, Vigour, and Liveliness. It then desists of its own Accord : But if the contrary happens, proper Remedies must be made use of ; amongst which the alkaline Salts, Nitre, or Pump-Water, along with some warm bitter aromatic Tincture, have the Pre-eminence. Sometimes indeed Vomits are requisite. Thus we pursue the Hints Nature gives us, and improve them by relieving the Constitution
of

of those corrupt Juices, that cause the Complaint.

An Obstruction of Urine rarely happens ; but when it does, it is most commonly owing to some slimy Matter sticking in the Neck of the Bladder, which the diuretic Power of the Water, tho' great, cannot break through ; it is therefore in vain to attempt it with any other Medicines taken inwardly. It will be most adviseable to have Recourse to a proper Instrument, called the Catheter ; which at once opens the Passage, and oftentimes breaks and divides the obstructing Mucus. First indeed a Trial may be made to dissolve it with an emollient saponaceous Fomentation, or a Semicupe, in which the Bottom of the Belly must be rubb'd with Soap ; at the same Time to press and squeeze the Abdomen, with hot wet Flannels, must not be neglected.

Costiveness seldom attends the drinking of the *Llandrindod* Rock-Waters. But if it happens, the Pump-Water may be taken to the Quantity of a Pint at Night, going to Bed, and about half a Pint in the Morning early. Afterwards proceed the same Day to drink as usual, or as directed, the Rock-Water. Such Food must be contrived as naturally tends to render the Belly soluble.

For

For some relaxed Stomachs, that have been accustomed to hotter Liquors, this Water is at first too cold, and causes Pain in the Bowels, and flatulent Cholics. This Quality may be corrected, either by Carminatives, or the Essences contrived, and invented by *Stabl* and *Wedel*; which, for this Purpose, are excellent Remedies. But if, notwithstanding the Administration of these, it continues, and remains immoveable, then anodyne Glysters, for Refuge, must be fled to. A warm Plaister may be applied to the Pit of the Stomach: But sometimes it proves so obstinate, as to require the same Treatment as other Cholics.

Heat, or burning Pain in the urinary Passages, is a very common Symptom to those that are afflicted with the *Fluor albus*, or seminal Gleet, or such like Weakness. In this Case bathing the Parts affected in a Decoction of emollient Herbs, and mixing Milk along with the Water, proves often serviceable. But if by these Means it abates not; then more powerful Remedies, as Emulsions with Gum Arabic, camphorated Boles, &c. must be joined, and taken along with the Water.

Eruptions in the Fundament, Excoriations of the *Sphincter Ani*, or a kind of Hæmorrhoides, which sometimes bleed, are not unusual

usual Companions to the Water-drinkers. These troublesome Complaints most commonly cease of themselves, as soon as the acrimonious Juices are carried off. But in the mean Time, to procure Ease, the Part affected may be anointed with *Unguentum Sambucinum, ex Mucilaginibus, de Althæâ, &c.* or the Ointment made of *Sperma Ceti*, white Wax, and Oil of Sweet Almonds, will perhaps be found the most efficacious, as well as the most neat.

Sometimes an Obstruction of some necessary Evacuation, as that by Stool, Urine, or Perspiration, or an impartial Excretion of them all happens, and there ensues a febrile Disposition. This is the worst Consequence that can befall a Water-drinker ; and is a sure Forerunner of some Mischief, and a certain Indication, that the Waters will not agree with the Constitution. This Case must never be neglected ; but Relief must immediately be sought for ; first by a gentle Vomit of *Ipecacuana*-wine ; and the Operation must be promoted by drinking plentifully of an Infusion of Chamomile-flowers in Water. Glysters, and gentle Openers, must be had Recourse to, to loosen the Belly. And lastly, a Diaphoresis should be raised, with the Assistance of the compound Powder of the

Contrayerva-

Contrayerva-root, with Nitre, and plentiful Dilution, with some cooling Apozem taken warm : After the Patient has some few Days recovered of this Accident, he may venture upon the Waters again. But then he must proceed with Caution, diligently watching, that they pass freely through him, and observing, that he has all the Benefits of Nature. If notwithstanding, they produce the same Effect a second Time, they are not to be farther trusted to ; but the sole Stress and Confidence must be placed in the Pump-Water ; which, in some inflammatory Constitutions, oftentimes accomplishes that, which the Rock-Water refused.

A *Tenesmus*, or a constant Inclination to go to Stool, is another certain Indication, that the Water is not adapted, or agreeable to that Constitution, to which it happens. In which Case it will be requisite to make use of emollient Glysters, anodyne, nitrous, and absorbent Powders, to forsake the Rock-Water, and trust to that of the Pump.

A Return of the Pain of some past Disease, or a Relapse into an Ague, during the Course of this Water, is a Demonstration that the Diseases were never absolutely cured, or that the Ague was immaturally and improperly
stopped

stopped or suppressed by an unskilful Management of the *Peruvian Bark* : For it is certain, that the Seeds of these Disorders were left lurking in the Body, or flung upon some Viscus ; which, by the Efficacy of the Water being agitated, creates new Disturbances, or kindles the Disease afresh. Wherever this happens, the Patient may expect a fundamental Relief, by a due Continuance of its Use.

Sometimes the morbid Matter will be flung into the small capillary Vessels, and discharge itself by cutaneous Eruptions. This should be looked on as a certain Token of an invigorated and strengthened Fibre, and an extraordinary good Sign of approaching Health ; and it is therefore to be borne with Patience. Gentle Scratching in this Case may be indulged ; but a moderate Use of the Flesh-brush would be more beneficial ; or a light Friction with a rough Cloth, to wipe and force the morbid Matter out of its Strainers. When, by succeeding Appearances, we perceive that a Cure is completed ; a tepid Bath, made of the antiscorbutic Herbs, with a Solution of Salt Ammoniac, to wash away the disagreeable Filth, and to contract the Diameters of the Pores, that for the future they may not be blocked up, will be highly salutary.

The

The Cramp, in the Calf of the Leg, or in any other Part of the Body, denounces the good Effects of the Waters ; because it plainly indicates, that the Sinews have received new Vigour, and a fresh Supply of Nutriment, as well as Elasticity : However, to repel the superfluous Humidity ; to lubricate, and relax the over-stretched Fibres, and restore them to their just Medium ; warm Bathing, and exterior Unction, emollient, as well as repellent, may be necessary.

4. *What Management is requisite, after the Course is completed.*

As the Rock-Water is so powerful a Medicine, that it cannot be drank, with Safety, in so large a Quantity as three or four Quarts in a Morning, it therefore will avail little, to one that is about to leave it, only to decrease it to two or three Glasses ; since even that small Number will still keep up its medical Effects ; and it is very dangerous to travel with this Water circulating in the Mass of Fluids. It is therefore necessary to take a Purge ; or to drink the Water as one ; or, instead of that, the Pump-water ; and, for this Time only, to work it off with Water-gruel, and afterwards

entirely leave off its Use. In this Interval no Fatigue, no Hurry should be ventured upon. The Diet should be plain, and of easy Digestion ; and when thus the Patient has been three or four Days prepared, he may set out on his Journey : But to undertake it sooner, whilst the Water remains in his Body, would be a Rashness, which perhaps might be dearly paid for.

In his Journey, let him make no long Stages, but travel quietly and gently. After his Arrival we must, in a most emphatic manner, recommend Sobriety, to avoid every Occasion and Excess, that brought on his Distemper ; nor will this suffice : If he will preserve his Health, he must walk or ride Abroad, and not confine himself in a close warm Room. Every Extreme, in respect to Rest, as well as Exercise, must be avoided, not less than that of Eating and Drinking : For Aliment, he may take such Things as best agree with him. Let him not keep too late Hours ; nor lie too long in Bed in the Morning. In short, in all Things let him observe the just and golden Medium.

Exercise must by no Means be neglected ; because the debilitated Limbs, and relaxed Muscles, will never retrieve, and regain their
former

former Strength and Elasticity, unless they are used. Exercise in the open Air is (as we have just now intimated) above all others the best : But if the Inclemency of the Weather forbids this, an Exercise must be contrived within Doors ; such as Walking, Dancing, or the like ; for it is of such Moment, that it cannot be dispensed with.

As the Constitution is more than usually accustomed to Evacuations, by the Use of the Water, it will be therefore necessary, once or twice in a Month, to take a gentle Dose of Physic, in order to prevent a Plethora ; and to the End that, if any Dregs of the former Disease are left, they may be discharged out of the Body. By these Means, with the Help of the Divine Blessing, I doubt not but these Waters will be found highly beneficial.

5. *What Regard is to be paid to After-effects, or Consequences, which sometimes ensue in Process of Time. And what Regulations are to be observed therein.*

Not only all chronic Disorders, but every other acute Disease the human Body is subject to, are not confined solely to the Juices ; but are

disperſed thro' the whole Frame ; and in ſome Meaſure or other affect the Solids. As therefore theſe chronic Diſeaſes are deep riveted ; nay, oftentimes, become conſtitutional ; it is quite unreaſonable to expect, that all the Symptoms of a perfect Recovery ſhould appear on a ſudden. For as the Muſcles and Nerves are, various Ways, affected ; ſo the Water may lubricate them ; ſoften the peccant Matter ; open the Obſtructions ; and ſo far relieve the Conſtitution, that by Uſe and Exerciſe it may be afterwards enabled to diſcharge it. Yet if ſome Weakneſs, ſome Pain, ſome Stiffneſs remain for a Time, it is not to be wondered at. Hence it frequently happens, that ſo complete a Cure, or ſo perfect a Recovery, as was expected, does not take Place in leſs Time, than from ſix to fourteen Weeks after the Diſuſe of the Waters, and leaving the Fountain : Nay oftentimes the moſt pleaſing and ſenſible Effect is felt later. This is common to all other mineral Waters.

Since we may expect theſe Complaints afterwards, we cannot ſufficiently recommend that ſtrict and ſuitable Management already preſcribed, and ſo requiſite on theſe Occaſions ;

ons ; and if any remarkable Change happens, the Physic should be taken oftener. For it is natural to suppose, that the peccant Matter must be well evacuated, and a Plethora for some Time prevented ; lest the overstrained Vessels should suffer the defeated Enemy to rally his scattered Forces, raise fresh Recruits, and regain his Post.

B O O K II.

Contains the Experiments of the saline Purging, vulgarly called the Pump-water at Llandrindod. Its natural Existence and Causa originis are philosophically considered. From which, as well as from received Experience, its Qualities and Virtues are deduced and concluded; and necessary Directions are given in what Manner to use it beneficially in several Disorders.

C H A P. I.

Contains Experiments of the saline Purging, vulgarly called the Pump-water.

NO one can dispute the Antiquity of the saline Purging-waters; or question, but they were known, and medically used in the most early Ages; notwithstanding they were many Centuries in Disuse, and lay quite neglected; insomuch that, when they came to be revived, they appeared as new Discoveries; for

for that long Period had buried their Qualities in Oblivion, and hid all their Effects under the dark Veil of Ignorance.

The *Epsom* Water in *England*, and that at *Sedlitz* in *Germany*, were the first, that emerged into Vogue from this Chasm of Darknefs, in which they had so long lain buried. Dr. *Crew*, Dr. *Bridges*, and Dr. *Hoffman*, were the first that withdrew the Veil from over them, and obliged the Public with the *Rationale* of their Effects. *Becher* indeed had before treated of them, in his *Physica Subterranea*; but in such a manner, as to give but little Insight, either into their Origin, or Effects. But when the Curtain had been once opened, and their Influences on human Bodies had been manifested, many saline Springs of different kinds appeared: And, no doubt, many more will appear yet in Process of Time. For who ever dreamt, that saline Marl-water should shew such medicinal Virtues, as it has within these three Years last past?

Since then this Knowledge is, at present, only in Embryo; and we are but beginning to retrieve what was lost, in respect of the Contents and Qualities of these saline Waters; it is natural to conclude, that our present Experiments are but vague and imperfect. This

will appear evidently, if we observe the medicinal Effects that are caused; and pay but some small Attention to the Cures performed by this Water; and compare them with our Experiments; which we shall find to fall far short in accounting for such great Effects. Hence it is plain, there are some active Parts in these saline Waters, which have hitherto escaped our Researches, and which, as yet, we have not been able to obtain in the best and most accurate Processes that have been made. For we will not, in Imitation of the People of *Glastonbury*, attribute their Effects to a supernatural Power, existent and residing there in an extraordinary Manner; but rather conclude, that what escapes us, is entirely in the Salts; and that for these two Reasons.

1. We may, in other medical mineral Waters, obtain any or all their Contents, let them be ever so volatile.

2. As long as these Salts act as Purges, when taken in the Water, they strengthen the Constitution, instead of weakening it: But as soon as they are extracted from it (let the Operation be ever so carefully performed) and taken afterwards as Purges, they are very little better than the rest of the artificial Preparations. They, like the others, weaken and enervate
the

the Constitution ; instead of invigorating it, as they do when taken in the natural Compound.

Hence it is, that we conclude, that there is something so subtile, and totally imperceptible in these Salts, that, hitherto, we have not been able fully to investigate their Nature : And as we can obtain the ætherial, volatile, mineral Spirits, as well as the Salts, we therefore reasonably conclude, that it is distinct from this last-mentioned Principle.

There is no Question, but the Qualities of Salts, which Nature, amongst the Multiplicity of her Productions, has furnished us with, was well understood by the ancient Chemists ; because the whole advantageous and lucrative Part of the Science depends thereon. But all this was lost, in the Times when the tyrannical Emperors, alarmed and jealous at the immense Wealth accruing from that Art, burnt and destroyed all Books extant about it ; lest the Artists should grow too opulent and powerful. But this Precaution is, indeed, quite unnecessary to be taken by the Monarchs of the present Age ; when Poverty is become, in a manner, the true Characteristic of the modern Chemist : Happy, however, may he be in this ; that his Disappointment may give him
that

that religious Resignation and Contempt of the World, not to be purchased with Gold ; and of which none, but those who possess it, can possibly know the inestimable Value.

The chief Article we want in our present Experiments, is an immediate Precipitation of the Salts from its watery Vehicle ; that is to say, to precipitate the Salt out of it's watery Solvent, as Silver is precipitated out of *Aqua Fortis*, by the Help of common Salt, or Copper. Whenever we attain to this Art, we then shall have these Salts in their utmost Perfection. They then will have the same salutary Ends, at any Distance, as the Water has at the Spring-head ; because we have Reason to believe, that this subtile Matter, which is destroyed in the Evaporation, will be preserved in the Precipitation. I need not here, mention the great Benefit, that would accrue from such a Discovery. The Thing is obvious. A small Quantity of Salt is easily exported to any Distance : But that is the least Advantage.

That there is such a Thing in Nature as to precipitate Salt out of its Solvent, seems to be indicated in several Instances. For Example ; Sea-water will extract the Salt out of salted Meat, or Flesh. A particular Sort
of

of Clay will suck up all Salt, and make the salt Water sweet and pure, if filtered or strained thro' it. Even Rock-Salt itself is a natural Precipitate, caused by a Glebe or Stratum of this already mentioned particular Sort of Clay. As then all our chemical Endeavours are no more, than to imitate Nature, and separate the heterogeneous Matter, from that which is homogeneous ; why should we not attain to this useful Secret, if we did but apply ourselves to it ? An Author and Traveller of Repute * informs us, that all Waters, for common Use, in *China*, are brackish or saltish ; and that these Waters are perfectly purified and rendered fit for Use by certain Leaves of that Country : From which some have concluded, that these Leaves were the Tea ; but it is not so. The Tea indeed gives brackish Water somewhat a better Relish ; but this is owing entirely to the Tincture of the Tea-leaf ; which by the Help of the Salt is more opened, and its Contents of Virtue more radically extracted. Hence it is, that *Thames*-water is more fit for making Tea, than Spring, or any other, destitute of Salts.

* Father *Le Comte*.

Another Traveller, * in *China*, tells us, there is a River in that Country, the Water of which is so very turbid, as by no Means to be potable, or proper for any other esculent Use; yet is made fit for all Purposes by Means of a little Alum put into a Jar full of it; which, being well shaken, perfectly purifies, and makes it, after his manner of speaking, an excellent, wholesome Water.

No doubt but Alum will purify and refine turbid Waters; and even precipitate the gross saline Parts; insomuch that it will not interrupt a Fermentation: For the Bakers in *London* treat the *Thames*-Water they use for their Bread in the same manner, and refine it with Alum. But I can, by no means, so far agree with our Author, as to call it excellent, good, or wholesome; for I am quite of a reverse Opinion in this Respect; and have often wished, that the *London* Bakers would forsake this evil Practice, so destructive to the Health of Mankind. However, from what has been said we may infer, that there is a Tendency in some natural Productions to precipitate Salt from its Solvent: And I heartily wish, that these natural Indications may lead and guide

* Father Navarette.

us to a perfect Discovery of this Mystery ; by which, I am sure, the Public would be greatly benefited. In the mean time we must proceed according to such Experiments, as we are acquainted with ; and if we should be so lucky as to give any Help towards such an Improvement, we shall think our Labour very well rewarded.

Experiment 1. The Soil thro' which this Water strains, is mostly a fine Gravel, intermixt with Clay of the Marl kind : Out of which it rises as clear, as any other common Spring-water.

Exper. 2. The elastic, volatile, ætherial, mineral Spirits of this Water were collected or concentrated into Zink or Speltre-ashes.

Exper. 3. This Concrete was found of an agreeable Fragrancy, and of a bituminous Nature, not unlike that of Ambergris, quite destitute of ferruginous Contents, or volatile vitriol Spirits ; but plentifully endowed with a mineral Aromatic.

Exper. 4. This Water, exposed for many Days in the Air in an open Glass, retained its Clearness ; but became flat ; and a greater Quantity was required for purging.

Exper. 5. If the Air is suffered to have its Influence some Time upon this Water,
it

it becomes hard, and sits uneasy upon the Stomach.

Exper. 6. It will bear Exportation, as good, and in as full Perfection, as the *Hyde*, or *Cheltenham* Waters, provided it be well corked up.

Exper. 7. This Water, taken from the Fountain-head; or, as long as it is preserved from the Air, is perfectly agreeable to the Stomach; and causes no Gripes.

Exper. 8. The Flatus or Excrements of the Patients, under a Course of drinking these Waters, have not that Smell like Gunpowder, which is caused by other saline purging Waters.

Exper. 9. The Water being put into a Retort for Distillation, and being boiled to the Consumption of about half, there appeared some oleaginous Substance floating on the Surface, which was of a fine fragrant agreeable Smell.

Exper. 10. With Spirit of Salt this Water sparkles much; and they gradually unite with one another; but no Alteration is made in the Colour.

Exper. 11. With Spirit of Nitre, and with Spirit of Vitriol, this Water makes no manner

ner of Alteration ; but Oil of Vitriol makes it hot.

Exper. 12. No Alteration with Spirit of Salt Ammoniac.

Exper. 13. With *Sal Absynthii* it appeared milky at first ; and, by standing till the succeeding Day, it contained a Precipitate, of a whitish Colour.

Exper. 14. Spirit of Hartshorn caused, at first, a Milk Colour ; but next Day the Precipitate appeared of a Brimstone-yellow.

Exper. 15. *Oleum Tartari per Deliquium* causes no other Change, but a Pearl-coloured Cloud near, or on, the Surface of the Water.

Exper. 16. *Saccharum Saturni* changed the Water, at the Fountain-head, into a Milk-white Colour. The next Day, the Precipitate, being settled, inclined to Yellow ; but the Water, above the Precipitate, appeared of the Colour of Whey.

Exper. 17. With Mercury Sublimate not any Alteration at the Spring-head was made ; but next Day a bright transparent Pearl-colour appeared ; and Plenty of small elastic Globules or Bladders lined the Inside of the Glass.

Exper. 18. Spirit of *Sal Volatile*, at the Fountain-head, caused a Pearl-colour ; and the next Day a white Precipitate.

Exper.

Exper. 19. With crude Alum, at the Fountain-head, it appeared of a Saphire Blue, inclining to White ; and next Day there was a Sediment more Blue.

Exper. 20. At the Fountain-head, with crude Sal Ammoniac, no Alteration was made ; but next Day, there was a plentiful Appearance of the elastic, volatile, mineral Spirits.

Exper. 21. Not any Alteration ensued with Galls ; nor did there, the succeeding Day, appear any other Colour than what Galls will give to common Water.

Exper. 22. Cochineal, at the Fountain-head, strikes a dirty purple Colour ; which the next Day was precipitated in a dirty Black ; but the Water above the Precipitate was transparent, and the Colour inclined to Purple.

Exper. 23. Red Saunders, at the Spring-head, gave a red Colour ; and the Precipitate next Day was the same ; but the Water above the Precipitate appeared of a yellow Cast.

Exper. 24. Silver Leaves, being put into this Water, were not changed ; neither the first nor several Days afterwards, in respect to Colour.

Exper. 25. Evaporate in a Glass Receiver this Water, and each Quart will be found to contain about 80 Grains of Sediment.

Exper.

Chap. I. *Experiments on the Pump-Water.* 145

Exper. 26. By the Separation of the Salts from the earthy Parts, these 80 Grains will produce 60 Grains of clean Salt; and 20 Grains of opaque terrestrious Matter.

Exper. 27. The 20 Grains of opaque Matter will readily flux in the Fire; and emit an agreeable Smell like Amber.

Exper. 28. The Crystals of this Salt shoot in fine short round Spangles; and are greatly different from those Crystals obtained from the *Cheltenham*, *Scarborough*, and other saline Waters.

Exper. 29. This Salt will not decrepitate in the Fire; but, without Crackling, will easily melt and fuse like Wax.

Exper. 30. Smelt this Salt with Glass, and it will not alter its Colour; nor, in any Degree, stain the Glass.

Exper. 31. Upon an Affusion, either of the strongest Acids or Alkalies, there ensues not any Effervescence with the Salt of this Water.

Exper. 32. This Salt can't be chang'd, *per se*, into an Alkaly.

Exper. 33. This Water is somewhat heavier than common Water; but exceeding light, considering it as a saline Water.

Since we have, in the Beginning of this Chapter, bewailed our Deficiency in the Know-
L ledge

ledge of Salts ; it will be necessary, before we draw any Conclusions from these Experiments, to observe certain Facts, that regard their Doctrine.

1. A True Knowledge of Salts is the chief Qualification of a Chemist ; because there is nothing under the Canopy of Heaven, which we can possibly meddle with, but what contains them.

2. Notwithstanding this Universality of Salts, yet there are but two originally found in all Nature's Productions, *viz.* an Acid and an Alkaline ; and from these two the Multitude of different Salts, we are blessed with, have their Origin and Existence. The great Difference observable in these two, or each of them, is owing to the different and various Mixtures of other Bodies therewith. For Instance, the Salts in the mineral Waters, altho' they are of the Acid Tribe, yet change their original Constitution, by the different Minerals and Fossils they meet with in the Bowels of the Earth, or which the Water conveys to them ; so that hitherto there has never, in any known mineral Water, a perfect pure acid Salt been found.

3. The Salts are able to cause various Changes in Colours ; and with their Assistance,

ance, all capital Colours for Painting may be produced. For Instance, the Liquor of Salt of Tartar precipitates a white Colour out of a Solution of Lead. Any alkaline Liquor makes dissolved Copper subside Blue. Galls strike Iron, dissolved in a vitriolic Acid, blackish, blue, or purple: And so *ad Infinitum*. All Metals, Semi-metals, and Fossils, produce, with their respective Salts, peculiar Colours, if mixed in a State of Fluidity *. Hence it is, that we use, in the Course of these Experiments, divers Salts; that from the Colour they produce we may conclude what their Contents are, as we can very rightly.

4. Dr. *Short* very justly observed the Utility of Colours produced by mineral Waters; for undoubtedly this Affair is of greater Use, than to judge of medical mineral Waters, and ought not to be limited to them only. It is certainly of great Benefit, as an Assistant in discovering the Mines. I therefore wish the Study was further extended; and, in particular, pursued and patronized by those, whose Business it is to search for Mines. — But we will leave this Subject at present, and

* *Vide Scripta Stahlil & Neumannil.*

return to our saline Water ; and establish its Contents on the before related Experiments.

1. This Water has its right Soil. A loose Gravel, and Marl-clay will always let the saline Waters pass thro'. This sort of Clay, being of the friable kind, is unfit to make Brick, or earthen Ware of ; and without a monstrous large Quantity of alkaline, or other proper Salts, cannot, nor even then, without great Difficulty, be vitrified. Hence it is, that these Kinds of Clays never attract any Salts from the saline Waters that strain thro' them. But where, on the contrary, these Waters happen to meet with a Clay, that is fit for Fire-brick, and strong earthen Ware, or such as will easily fuse into Glass, with a moderate Quantity of vitrifying Salts ; such Clay will always rob all Waters of their Salts in their Passage thro' it ; because these sorts of Clay are most commonly destitute of Acids, and wherever they meet with Acids attract them greedily. Now all these Salts contain a Share of Acidity, which is most intimately united with the saline Texture, which cannot exist without it. This Acid then would be attracted by the Clay, and the entire saline Texture would be destroyed ; and the Water
would

would pass pure, and destitute of any Salt whatever, if it was of another Nature.

2. Of what Nature and Quality the volatile, ætherial, elastic, mineral Spirits are in this Water, we are informed by Experiments the 2d and 3d. And we are indebted for this Ambergris Bitumen to the Sulphur-water, which is contiguous to the saline Purgewater. Both have a great Affinity to each other; and are seldom or never found without each other: And by Experience it is evident, that wherever we dig below, or through the saline Spring, that then the first Water or Spring, that sets in below the Salt Spring, is most commonly a sulphureous one *, from whence some Matter, continually exhaling, the saline Water gathers, and collects it; and thus obtains its ætherial, volatile, elastic, mineral Spirit: Nor need we wonder, that they change their Nature by the Admixtures with a saline Body: For Ambergris itself, when its Salts are extracted from it, emits no more the pleasing, but the most disagreeable sulphureous Smell: So that it is entirely owing to Salts, that the Scent or Smell is so fragrant in

* An Instance of this kind is recorded by Dr. Scheuchzer, in his *Hydrographia Helvetica*, Page 300.

this Fossil. That Ambergris is a Fossil or mere Pitch, is no longer doubted ; since the Great *Newman* proved it to the Royal Society in *London*.

3. It will be asked, What a mineral Aromatic is ? I allow there is no such Thing in Being. I only speak comparatively ; and my Meaning is this ; that it is as agreeable to the Nerves, or acts in the same easy stimulating manner as a vegetable Aromatic (which is the true Aromatic) does ; and is as grateful to the Stomach. I am very sensible, that these subterraneous Damps are not only mineral, but also are certainly metallic. Let us but look into the Book of Nature (I mean, in inspecting Metals or Ores in their Veins, or in their proper Matrix) and we shall be astonished to behold the great and unerring Care of the Almighty, in providing glandular Tubes, and Strainers, through which these subterraneous Damps and Steams are conveyed ; which, by a Series of Experiments, and long Observation, have been found absolutely necessary, for the Maturation and Perfection of the metalline Ore. The same Care of the All-wise Creator appears in providing proper Locks with Water, and Springs to condense, and give a due Consistence to these Damps ; so as
to

to make a perfect fecundating Matter of them. Both these Provisions for the metalline Ores are equally necessary. And where we do not meet with this second Case, but find the Damps alone ; there then is a Miscarriage or Abortion in Nature ; in which Case the Damps change the metalline Ore into a Substance like a burnt Brick, which by the Miners is called *Kevel*. From hence then it is plain, that these subterraneous Damps are of a metallic Nature ; because the Effect they have upon the Ore, or even upon a separated or purified smelted Metal, convinces us beyond Dispute, that they are of the same Nature ; for nothing but its own Principle could produce these surprising Effects.

4. Since from Experiments we are assured, that the ætherial or elastic, volatile, mineral Spirits, are, or partake of the Nature of, Ambergris ; we may therefore rest contented, that they are salutary, and safe. Nevertheless, tho' all subterraneous Damps are of the metalline kind, yet they are not always salutary ; but sometimes convey poisonous Particles to certain Waters. There are many of this latter Kind in *Italy*, and elsewhere. But Ambergris has for many Ages been Part of the *Materia Medica*, and has been prescribed as a

Cordial and Stomachic : Yet all the Good I conceive it produces on the saline Spaw at *Llandrindod*, is no more, than that it makes its Water agreeable to the Stomach ; for in Proportion as that is exhaled, the Water becomes less easy on the Stomach. Tho' Ambergris is an excellent Analeptic, yet I lay no great Stress on its being of any considerable Service in this Respect ; because, was the Quantity even more, it would be overpowered by the Salt of the Water.

5. Experiment the 4th teaches us, that the bituminous Matter is volatile, and exhales when exposed to the open Air : And, as observed in the fifth Experiment, the Water afterwards sits uneasy upon the Stomach. Hence it is evident, what infinitely more Benefit they are likely to receive, who drink the Waters at the Fountain-head, than they who do not. It is, nevertheless, evident from the sixth Experiment, that this Water will bear Exportation ; provided it be secured ; yet it cannot be expected, that it can produce the same salutary Effects, as if taken upon the Spot. No Water retains its primitive Virtue if secured and carried, after the usual manner, to any great Distance ; because Air and Water have such a Connection with each other, that the latter for ever will change, when the former can

can act upon it. For Example, let us convey the lightest Water we can get, into a Place where the Air is stagnated; and we shall, in a Moment, be convinced, to what an amazing Degree the Water will attract a Ponderosity: And if it remains long enough, it will become quite fetid; to which Quality it ever has a natural Propensity. To this it is chiefly owing, that the saline Water sometimes becomes fetid in the Bottles it is exported, and preserved in; This, however, may be rectified, by opening and exposing it in a clear untainted Air; which will again render it fit for common purging Purposes; but I can't recommend it as an Alterative.

6. What we have said is again confirmed by the seventh Experiment. The ætherial, elastic, volatile Spirits in these Waters, are not so perceptible as in the Chalybeate; that is, they strike not so much our Senses by Sight, Smell, or Taste: Nevertheless, they are endowed with them. And this, indeed, is a Circumstance concomitant to all saline Purging-waters. For if there should be any, that thus sensibly affect us; we may take it for granted, without the Trouble of making Experiments to prove it, that they always carry chalybeate Contents with them. That these ætherial,
elastic,

elastic, volatile Spirits are of the utmost Consequence in Medicine is past Dispute. They are even of more Importance, than we as yet are able to inform our Readers. But we hope farther Searches will enable us to discover greater Certainties, for the Benefit of Mankind. Thus much we know for certain ; that they invigorate the Nerves ; encrease the Elasticity of the Fibres ; and, in short, strengthen a weak and feeble Constitution ; and act as never-failing Bracers to a puny feeble Stomach. If therefore they had no other Virtues than those just mentioned, we could not say enough in their Commendation.

7. If any saline Waters communicate a Smell like Gunpowder to the Flatus, or Excrements of him that drinks it ; there is then an Acid in the Water, which is not sufficiently digested, combined, or enveloped with the other Contents. Sometimes it is absorbed by the earthy Parts ; and sometimes it is united with the Salts, or the ætherial, elastic Contents. No Water is without it ; but these Waters are for ever best, where the Acid is so well combined, as not to be perceptible, unless by capital Experiments. These are, at least, better adapted to chronic Disorders, than those where the Acid is vague and undigested :

gested, travelling about them like a Vagabond ; because chronic Disorders are always accompanied with Obstructions in some Part or other of the Body. On this Account, this natural Acid is always detrimental ; particularly, as we must expect too much of it in the *Prima Via*. If, in some Cases, more Acid is wanted, it may be added at Discretion. That the *Llandrindod* saline Water is destitute of this Impediment, is evident from Experiment the eighth,

8. That there is a mineral Oil in Nature, will admit of no Dispute ; it being well known, that many hundreds of Quarts are annually obtained in *Staffordshire* from Rocks, and sold under the Name of *British Oil*. However, we have four Sorts of *Oleum Petræ* in the *Materia Medica* ; a Black, a Red, a Yellow, and a White. All these are, of themselves, Oils ; and naturally flow out of Rocks. From which they may, without any further Art or Trouble, be collected, and obtained. These Oils are mostly brought out of *France* and *Italy* : And as they pass through a long Commerce, we may consequently expect great Adulteration. The true Criterion or Trial is, for the Chemist to see if it will swim upon Water ; which that which is adulterated will not.

not. Hence we may conclude, that the Oil which appears upon the Retort is a mineral Oil ; which is combined with the Salt in the Water ; so that when half is consumed, it appears and shews itself : And the more the Water, as its Vehicle, evaporates, the more there appears of it. For this Reason, after the first Evaporation, the Salt will not crystallize : So that, if we will have any Crystals, we must redissolve this Salt in Rain-water ; and, by Filtration, separate this Oil from it again ; and then it will easily crystallize. From whence does this Oil, mentioned in the 9th Experiment, proceed ? It is not from volatile, ætherial, elastic mineral Spirits ; because it is of another Kind. It likewise carries no such gross Parts with it, as to constitute an Oil. And lastly, they are all exhaled, before the Water begins to boil. We may therefore safely aver, that it does not proceed from hence ; so must look for it in another Place. Turf is a kind of a bituminous mineral Fossil, and is plentifully endowed with Oils of this Species ; which, however, must be obtained from it by Distillation. Now, as there is a Multitude of Turbaries upon all the Commons about *Llan-drindod* ; from whence the People of the Country fetch their Fuel ; one may venture
to

to believe, that this Oil comes from some of these Turbaries ; and mixing with the Spring, or subterraneous Current of this Water, is incorporated with it by the Help of the Salts.

As to the medicinal Virtues of this Oil contained in the *Llandrindod* Water ; it is an excellent Antiscorbutic ; as is verified by the *British* Oil ; to which this certainly has the Preference, by being better digested, and more nicely separated in Nature's Laboratory. This Oil is likewise an excellent Remedy for Kibes, benumbed Limbs, and contracted Sinews. It is therefore manifest what Service this saline Water must be of, if artificial hot Baths were made of it.

9. To the last-mentioned Oil it is owing, that a Conflict arises when the Salt is added to it, as is affirmed by Experiment the 10th. Nevertheless, this Water contains an Acid ; which is the Constitutor of its Salts : And this Assertion is affirmed by Experiment the 11th. However it is somewhat surprizing, that it causes no Alteration with the Spirit of Sal Ammoniac ; which, in fact, is an alkaline Spirit, or one that comes nearest the Nature of an Alkaly ; for it contains some Acid, but considerably less than of Alkaly. This I can attribute to nothing but the Oil ;
which,

which, as it were, sheathes and envelopes the Acid in the Salt; and being thus interspersed thro' the watery Vehicle, the fiery alkaline Parts of *Spirit. Sal. Ammon.* are blunted thereby. Wherefore these two Opposites can't come into a Contact with each other, on account of this their Guardian, that always interferes, But when stronger Alkalies appear, that are able to render oily Particles saponaceous, the Case is altered; and a Separation must ensue. The Oil of Vitriol (altho' it makes it hot) and the other vitrioline Acids, very quickly mix with this Water. From which Circumstance we may very safely draw favourable and salutary Conclusions; considering how much the Juices of chronical Patients abound in Acids.

10. The asserted Acid in this Water stands again confirm'd by Experiments 13, 14, and 15; for no Precipitate could ensue, was the Alkaly predominant. But what this Precipitate is, is the Question? however, I will be so bold, as to affirm it to be an Alkaly. And here, I am well assured, that an Alkaly is precipitated by an Alkaly: For which I account thus. There is an Alkaline contained in the Salts; without which they could not exist.

exist. Now, when the Alkaly comes to be mixt, it swallows and overpowers the Acid immediately, which then lets loose and precipitates the earthy terrestrious Parts, which is our Alkaly. As to the yellow Colour, that appears in the Precipitate in the 14th Experiment; I know some will fancy it to be owing to Sulphur in the Water: But that argues nothing; because, in the foregoing Experiment, the Precipitate is white; which I attribute to nothing else, but to the animal Oil, in the Spirit of Hartshorn, left after Distillation. Again, we find the same in the 16th Experiment; which is also owing to the contained Oil, in the Vinegar, which the *Saccharum Saturni* is made with. That there is not a great deal of alkaline Earth in this Water, is proved by the 15th Experiment. For we see, that it requires the strongest Alkalies to produce any Precipitate at all; and when produced, it is but in a small Quantity: But when the Alkalies are mild, as in the *Ol. Tartari per Deliquium*, the Case is otherwise; and no Precipitate can be obtained by its Affusion. Hence it is evident, that this Water may be recommended in all Cases where Alkalies are prejudicial; especially as that very small Quantity, which it contains,

is so well guarded, and neutralized by the opposite Principle, Acidity.

11. *Saccharum Saturni* is, and always was, constantly one of the Ingredients attending the Train of Experiments made on saline Springs; which often is not without its Merit; particularly in such Waters, where noxious metalline Particles are suspected; but I think in the saline Waters we might do without it: However, since it is so generally used, we did not chuse first to lay it aside. The Precipitate we find in the 16th Experiment caused by it, is partly its own, and partly the alkaline Earth of the Water: For where *Saccharum Saturni* happens to meet with a mineral Acid, it discharges itself from the vegetable Acid it is made with. This is the Case in the present Experiment. The Precipitate is the natural alkaline Earth of the Water; which the Acid of the Water let loose, and suffered to fall; to which the vegetable Vinegar-earth, which the *Saccharum Saturni* was made with, is joined; and thus there is caused a yellow Precipitate. On the other hand, the vegetable Acid of Vinegar keeps the water turbid; and hence it is, that it caused the Whey-Colour. Upon the whole,
this

this Experiment confirms, what already has been said, and convinces us, that there are no noxious metalline Parts contained in this Water. But of somewhat more use is that with Mercury Sublimate ; altho' I have condemned it elsewhere as much as the *Saccharum Saturni*. Because Sublimate produces a white Colour, with a volatile Alkaly ; a yellow with fixed alkaline Salts ; and a transparent Pearl Colour with neutral ones ; and if any metalline or semi-metalline Particles are mixed with it, they shew, accordingly, their natural Colour. Thus much may suffice for the 17th Experiment. The 18th we will also pass over in Silence, in order to avoid Repetition.

12. The 19th Experiment is set down as I made it, at the Fountain-head, in the Presence of several Gentlemen. But I am afraid the blue Colour was not owing to any Particles or Contents, with which the Water is impregnated ; for I verily believe, that the Alum was powdered in a dirty Brass Mortar ; to which Cause I attribute the Blue, perceptible in the Tincture as well as Precipitate. For was there any metallic Particles in the Water ; whose Property it is to cause such a Colour ; they would have appeared before,

and much more conspicuous, in the 20th Experiment made with crude Salt Ammoniac; from which no metalline Principles can hide themselves. From the 21st Experiment again we are assured, that there is neither crude Vitriol, Iron, nor Alum in this Water: Otherwise it would not have left the Galls unchanged; but would have tinged some Colour or other. So that we may safely venture to say; this saline Water is pure, void of metallic Parts, and free from all austere, coarse, rough, corrosive Salts; and there is nothing contained therein to debar such as are afflicted with inward Ulcers from making use of it.

13. The two succeeding Experiments, *viz.* 22, and 23, convince us, that the Salt of this Water is perfectly neutral. For if either Alkaly or Acid had been predominant, they would have caused some real perfect Colour with those red Drugs. Nor is there any Sulphur in it, notwithstanding it is so near the sulphureous Spaw; as is evident from the 24th Experiment. Hence we cannot but behold the Goodness of the Divine Creator with the greatest Amazement; when we see how near each other he has placed these two excellent Currents, so different in their medicinal Effects; to the End, that in such Disorders

orders, where one is detrimental, the other may prove salutary. For Example, in arthritic Disorders, where the morbid Matter is dispersed thro' the whole Frame, the sulphureous Water would be highly improper ; because it would cause too great an Irritation, and render every Part liable to an Inflammation, without disposing to a true Crisis. In this Case, the saline Pump-water is the true Panacea, from which alone the Afflicted can find Relief. Again, where there are any Tetters, or Ulcers, of a scrophulous Disposition, which require a gradual Discharge, or where the Constitution is impaired by fast Living, there the sulphureous Spaw is greatly preferable to the saline one. The same may be said in many more Cases.

14. By the 25th and 26th Experiments, we are instructed how much Salt, and opaque terrestrious Matter these Waters contain. And here we ought to consider, that one Quart is a brisk Purge to the strongest Constitution ; and how it operates without enfeebling or weakening it. Is it not astonishing, that so small a Quantity of purgative Ingredients should work so briskly ? Sixty Grains are but one Dram : Now if we have Recourse to the very best extracted purging Salts, that are sold,

we are obliged to take at least four Drams in Quantity ; which is three Times more. What a surprizing Difference !

From Experiment 27, we may venture to affirm, that the terrestrious opaque Matter (in which the saline alkaline Earth, that enters the Composition of the Salts, is enveloped or entangled) is of the bituminous kind ; to which, in some Degree, the ambergrisy Spirit, that partly constitutes the ætherial, elastic, volatile mineral Spirits, incessantly sticks and adheres.

Experiment 28 informs us, by the Figure of the Crystals, that this Water contains no more Acid, than is barely necessary for the Formation of the Salts ; because the Size of the crystals depends upon the Abundancy of the Acid ; and the greater the Quantity of the Acid is, the larger are the crystals. But I must give a Caution here, not to lay any farther Stress on the Configuration of any saline Crystals.

The true Medium of the Acid Saturation is again proved by the 29th Experiment. Because Decrepitation, or Crackling in the Fire, is always owing to an improper Mediation of Acid and saline alkaly Earth : Which, for ever, cause coarse and griping Purges.

But

But, by this last-mentioned Experiment, its being a Neutral is again established.

15. The true Nature of Salts can never hide itself any longer, after it is committed, according to the 30th Experiment, to the Fire with Glafs. From its easily fluxing without any Noise in the Fire, and not emitting any Colour to the Glafs, I venture to range this Salt amongst the Borax Tribe. And I apprehend, it may not improperly be called *Sal enixum Boracis nativi*. This seems to stand confirmed by Experiments 31 and 32; for the true Characteristic of Borax is, not to be affected by Acids or Alkalies, and not to be changed, without Additaments, into an Alkaly.

On a Recapitulation of the Experiments, and from what we have observed upon them, we may venture to affirm, that the Contents of the saline or Pump-water of *Llandrindod* consist, for certain, of,

1. A *Sal enixum Boracis nativi*; which is saturated in Nature's Laboratory into a perfect Neutral.

2. A small Quantity of opaque bituminous earthy Parts: Which, tho' they are not dissolvable in Water, yet will very easily flux in the Fire.

3. Etherial, elastic, volatile, mineral Spirits, of the Nature of Ambergris.

4. Mineral Oil. And

5. The common Vehicle, Water.

C H A P. II.

The Nature, Existence, and original Cause of the saline Pump-Water of Llandrindod is philosophically considered. On which its Qualities and Virtues, in the several Diseases incident to human Nature, are established and concluded.

THE Great *Hoffman* has long since informed the World of the extraordinary Virtues, that are contained in mineral Waters in general; even so much as to render other Remedies, in a manner, useless. Since therefore the Divine Wisdom has dispensed, in Abundance, through all Countries, medical Springs, that are suited to the Cure of numerous and various Diseases of those Climates; it is to be lamented, that their Nature and Virtues are not known to such Physicians, in particular, to whose Charge the Care of innumerable Sick and Afflicted fall *. We there-

* *Vide Dr. Hoffman's Treatise on mineral Waters, P. 11*

fore think we cannot too much enquire into an Affair of so great Moment.

It cannot be denied, but that the learned Dr. *Hoffman* has given us the greatest Insight into the present Subject; and exploded the grossest Errors, and Absurdities, with which the mineral Doctrine was environed *. But it were to be wished, this great Man had observed a due Medium between the two Extremes. For, as others have fancied so many Things, or Contents, which naturally could not exist in the medical mineral Waters; so, on the other hand, he has exploded and stript off some Principles, that naturally and in reality they do partake of. For let any one examine Page 51; where he gives a Description of the Salts in mineral Waters; and tells us, that they are in a manner unknown, being of a neutral Nature, betwixt Acid and Alkalies; that some of these Waters abound considerably in Salt, insomuch that 12 Ounces of some yield a Quarter of an Ounce of Salt; and Page 82; where he describes the bitter Purg-ing-water of *Sedlitz* in *Bohemia*, to whose Salts he also gives the same Name: And whoever will be at the Trouble to examine both

* Page 12.

Places, will find a manifest Contradiction; and a great Want of a true and intelligible Description of the several Salts, both in respect to their Names and Characteristics.

These Waters pass through so many different Fossils, that every Spring abounds with different Contents. Is it then natural and reasonable to suppose, that the Salts (which have still greater Connexion with the Fossil they pass thro', than the other Contents) should remain untainted, and be, in all Waters, one and the same? I ask, Is it not too great a Concession to grant this Supposition? Therefore, though the great *Neuman* has joined with him in Opinion; yet, as it is an Error, it is but prudent and discreet in us to dissent from them; especially as they explode such Salts as are very essentially, and manifestly dispersed thro' the Bowels of the Earth; and which it is impossible but that some Spring or other must dissolve, and convey them along its Channels.

It has so happened, that in the present Waters, the Salt I have obtained is such a one, as is exploded by the before-mentioned Gentlemen. On this, as I have obtained it by the Experiments I made upon the Waters, I cannot but rely: But, at the same Time,

am very ready to hearken to Reason and Facts ; and if an Error in them can be proved, I am as ready to recant it, and make all possible Atonement for my Fault. But let us return to the Matter in hand ; and consider the real Existence of the Salts we obtained by our Experiments from the saline Pump-water at *Llandrindod*.

All Salts of this kind are, and for ever will be, the Productions of Under-ground Fossils (for every mineral Fossil has its peculiar Salts) from which they are either immediately washed, or mixed with several more that happen to come in the Way of the subterraneous Current : Or sometimes several Fossils have been found to be mixed in the Bowels of the Earth promiscuously ; which, for want of a Congruity, occasion there perpetually a sort of Fermentation ; which kind of Fermentation produces either a Heat, or a new kind of Salt ; and the Water-current that happens to meet with it, participates either of that Heat, or of the instantaneous saline Mixture.

Salts, generated in the last-mentioned Manner, make it not very easily to distinguish from what kind of Minerals they proceed. But those that are washed from the Fossils, without the last-mentioned Fermentation, are
more

more readily known ; because every Mineral has its peculiar Salt. For Example, all kinds of Limestone ; all kinds of Spar, Abeftos, Talc ; that kind of Slate called Scieffer ; Chalk, and many of the same Tribe, will, with the Helps of fulphureous Damps, and Acids, yield or constitute a common esculent Salt. Hence it is, that so many medical Springs are found to abound with common Salt ; and to this I attribute the Cause, why the new-fashion Medicine, that is so mightily cried up, I mean the Sea-water, was introduced. But I heartily wish that some very dreadful Consequences (which I really expect) may not be the Means to bring it into Disrepute. The Pyrites (commonly called the Brazil, Mondic, fulphureous Marcasites, or Copperas-stone ; and by many other Names) has an undoubted Share in the Generation of mineral Waters. This Mineral is most plentifully dispersed thro' the Bowels of the Earth : No Mineral-countries are without it. There are strong Reasons to make one imagine, that almost all other Metals have a supportable Interest, or Connexion with this Fossil. However we will wave this Point ; because it belongs to the Art of Mining ; which is at present foreign to our Purpose ; and therefore

which

which we will not farther mention, than as it appertains to our present Subject, the mineral Waters.

This Mondic, or Brazil, is the Cause of the last-mentioned Ferment or Commotion, which we frequently meet with in the Bowels of the Earth. For Example, the alkaline Earth of common Salt, mixed with this Mondic, will produce an uncommon Heat in Water ; and, what is more surprizing, will totally absorb the Acidity natural to such a sulphureous Mineral, without causing or producing the least Traces of Salt : I cannot, therefore, help conjecturing, but that this ought to be reckoned, oftentimes, the immediate Cause of the Therma. With Sea-water, Mondic (after it has sweated some Time with a sufficient Degree of Air) will break out into a perfect Flame ; and if some bituminous Matter is mixed therewith, the fiery Eruption is greatly facilitated, or sooner excited ; and becomes more perfect : Mondic is also promiscuously found amongst Coal. The Masters of Coal-vessels should therefore be prodigiously careful to prevent the Sea-water from coming to the Coal they carry ; or else they may chance to fall a Sacrifice to the Sea by the Means of the Fire.

If Mondic happens to mix with that kind of Slate called Scieffer, bolar Earth, or some other Fossils of the same Tribe, it will constitute a Salt, which is very rough and acidulous ; which, however, being dissolved and carried by long Passages thro' the Caverns of the Earth, comes to be more refined, and changed into a salutary mineral Water. Thus much is certain, that Mondic or Copperas-stone has sometimes its Share, or is the productive Cause of natural hot Water. And I really believe the Waters of *Bath*, in *Somersetshire*, are partly risen from thence. Sometimes also it may constitute a cold mineral Spaw. But this is not always the Case, as a certain great Man endeavours to make us believe ; for both hot, and cold mineral Waters exist, and generate frequently without it. All that we have hitherto related of the Product of Mondic, are the Effects of the before-mentioned Ferment : But one Property of this Mondic is very remarkable, which we cannot omit mentioning. When Mondic lies in a Vein ; or, in the Miner's Phrase, *rides* upon a Lead Ore, Copper, or any other Metal (except Iron) it then lies quiet without causing any Ferment whatsoever ; and only sends forth from its subterraneous Caverns a
prodigious

prodigious vitrioline strong four Water, with some light yellow Precipitate. In *Cornwall*, Mondic rides upon Copper Ore ; and is, in that Country, an infallible Sign of Copper Ore : Here, in *Wales*, Lead Ore has frequently been found under it.

To have a true Idea of medical mineral Waters, and of their Origin, we must examine the Soil thro' which they thrill or spring forth. Now the Bowels of the Earth at *Llandrindod*, are plentifully impregnated with this last-mentioned Mineral, called Mondic ; which certainly has a great Share in the Contents of the sulphureous, and undoubtedly has some in the Existence of the Pump-water. But this latter is so well refined from its Crudities, by the Clay through which it filtrates, that before it issues forth, it is entirely divested of them. On the other hand, the sulphureous Spring-water is but the Effect of a Ferment, raised by a confused Heap of Minerals ; amongst which the Mondic acts one Part in the Production. I might thereon venture to affirm, that though in that Neighbourhood there is no great Quantity of Mondic to be met with ; and what there is of it is not regularly placed in Nature's Matrix ; yet there is as much as suffices to yield that
Share

Share of Effect it has in the mineral Waters we are here treating of.

Bolar Earth, Spar of several kinds, Stones inclining to Talc, a chalky Clay, and many others of the absorbent kind, are in Plenty at *Llandrindod*; and interspersed thro' the whole Extent of the Course, or Range, thro' which the saline Spaw strikes.

The Spring of the saline Water of *Llandrindod* comes from the South, and runs to the North; and if it were dialed from the Fountain 4 or 500 Yards South into the Common, a stronger Water might be obtained. The sulphureous, or stinking Water, is about 100 Yards North from the Pump-water; and runs from North to South, as if it would meet the Current of the saline Pump-water: And about two Miles North from the medical Springs I expect a Bed of Coal; which Coal however is not yet discovered. Indeed it is the greatest Astonishment to me imaginable, that there has been no Attempt made to find out this valuable Fossil in that Neighbourhood; when the great Book of Nature gives us the most certain Indications of its Existence there. For whenever there is Brine, or Water, that will make common Salt, there is certainly Coal thro' all that Zonic. Hence it comes,

that

that Coal is always found near the Sea Shore; for it is impossible for Coal to generate, or exist without the Help of Brine. In *Germany* we have this Thing exemplified, and the Conviction placed before our Eyes. For we have Coal no where, but in such Places where this Brine-water is seen: And again, never is this briny Water without Coal. I doubt not, when this Knowledge comes to be more general, but there will be Coals found in *France*, and such Countries where they hitherto never have suspected them. Some of my Readers may find these my Assertions about *Llandrindod* verified; because, besides other Indications, there is a briny Water between *Llandrindod* and *Built*, or *Builth*, which I am sure is in the same Zonic with *Llandrindod*.

I am well aware, that this my Assertion will, to many, seem incredible; and perhaps be apt to subject its Author to the Ridicule of those who always reject, with Contempt, every Thing without the Compass of their own Conceptions. But no such Consideration should deter an impartial Enquirer into the Works of Nature, from generously declaring to the Public, whatever he believes conducive to their Emolument or Convenience; nor
make

make him do Violence to his natural communicative Disposition. Time and Experience are the only Judges that must determine Points of this Nature ; and to their Decision I quietly submit my Cause ; not greatly regarding the Sneers of Self-conceit, or the hasty Censures of temporary Malevolence.

But to resume. In tracing the Source and Origin of the Salt in the Pump-water of *Llandrindod*, we shall venture, without any further Preamble, to declare that it exists, or is generated, or formed by that Variety of Things it meets with ; that Brine, or rather that saline Water that will make the common esculent, or Kitchen Salt, is its Basis ; but that this Quality is changed, or transmuted, by the various Things it meets with in the subterraneous Caverns. Our Reason for this Belief is as follows.

1. This saline Spring takes the same Range or Zonic with the Brine-spring near *Built*. And, was its Course to be pursued about two Miles to the South, I doubt not but a much stronger Brine, than that at *Built* might be discovered.

2. The common Salt, known to all Mankind, is the Father of all other Salts under
Heaven ;

Heaven ; and any other Salts we are acquainted with may artificially be made out of it. Nay it is evident, Nature, in her Productions, changes common Salt into the several others we meet with : Nor is it less remarkable, yet it is equally true, that every Motion of this Salt causes a Change and Alteration in it.

3. Not any natural Menstruum I know of is so fit for the Purpose to constitute a saline, bitter, purging Water as Brine ; because it dissolves the most essential Parts of Spar, absorbent Earth, and other such salutary Fossils, as well as all bituminous Substances ; which last is even a constant Attendant to Brine.

4. No Salt is so able to penetrate, or percolate, thro' the Bowels of the Earth, as Brine, whenever it has the Advantage of meeting with such Glebes as will admit of it (which not improperly may be called Strainers) that it may disengage itself from all coarse Salts, such as Vitriol, Alum, or the like. That there are upon the Common of *Llan-drindod* the most excellent Glebes, thro' which this Water percolates, is certain ; and will also manifestly appear to such as will but be at the Trouble to make experimental Enquiries into their Nature.

I must desire here to be well understood. The Salt in the *Llandrindod* Water is now no more a common esculent Salt ; but it is in the State of the *Llandrindod* Pump-water ; such as I have described it in the first Chapter of this Book, and proved by Experiments. And this Salt is so changed, by other Admixtures, from common salt Brine into that State, in which we receive it in the *Llandrindod* Pump-water. This Assertion is not only grounded upon my own Experiments ; but it has long since been observed, by much more able, and greater experimental Chemists than myself *.

Thus much I chose to advance, at present, on the Subject, as to what the saline Water at *Llandrindod* has been. But now comes the Question ; in what Manner it was changed into its present State ? To which I answer. The several Contents, besides Salt, which this Water contains, are, without doubt, received in its Passage from the several Minerals and Fossils it passes thro', so that we need not enlarge on that Particular. The Change of the Salts seems to be the only Question which now occurs ; which, we conceive, is caused by nothing else but by the Steams and Damps, that constitute the Sulphur-water.

* *Stahl, Henkel.*

We have already observed, that the Sulphur-water's Current comes from the North, that of the saline Water from the South ; so that these two currents meet each other. There is however a small Dingle between these two Springs ; thro' which runs a Brook. In this Brook the Soils change ; that of the Sulphur-water is a Kind of Rock, and that of the saline Water is a Soil of Gravel, fine Clay, Spar, and several other Mixtures, lying not in regular Veins, or *Strata*, but promiscuously, in the same manner as Gravel commonly lies. Now I apprehend that the Steams or *Effluvia*, that impregnate the Sulphur-water, ventilate into this loose Kind of Soil ; where they meet with the Brine ; and being rarified by this loose Soil (particularly the Clay) the more gross Parts of these Damps become entangled therein ; and the most subtile ones change the esculent Salt into that State, we have it in the *Llandrindod* Water. In order to illustrate this Doctrine more fully, I made the succeeding Experiment.

We took Tobacco-pipe-clay, and spread it upon filtering Paper, not above the Thickness of a Quarter of an Inch ; and then made many very small Holes in it with a fine Needle. Thro' this we percolated Coal Damps, that were collected in Bladders, for this Purpose,

upon Sea-water : By which Means the Salt, after being cryftalliz'd, was found entirely changed ; and not much different from that we found in the *Llandrindod* Water ; except, that it fhoot into greater Spangles or Cryftals : Nor was the Bitumen-mineral, which is constantly in Sea-water, and that of a very grofs Kind, in the leaft changed. From this Experiment we conjecture ; that, could we but abforb the great Quantity of Acid, and that grofs bituminous Matter of the Sea-water, and add thefe other fine fubtile Contents, we then might very eafily fubftitute, and make a Succedaneum for *Llandrindod* Water.

Since we have mentioned the Sea-water, the Panacea, or fashionable Medicine of this prefent Age, we cannot pafs over it without giving our Opinion ; and informing our Readers, that on analyzing Sea-water, there appears fo many Crudities, that we conceive it highly detrimental to the human Body ; and fear the Ufe of it will, in Procefs of Time, manifefit its pernicious Confequences. That there are thefe Crudities the Salt-boilers can testify ; and in fuch Abundance, that they are obliged, in this coarfe mechanical Operation, to ufe Eggs, or Ox-blood for a precipitate.

In

In all *Germany* there is but one Fountain or medical saline Spring, as yet known ; which was discovered about forty Years ago by *Dr. Hoffman*, and lies at *Sedlitz* in *Bohemia*. Its Water is not near so good as that we are here treating of : Nevertheless, it has arrived to a prodigious Pitch of Fame, for the many remarkable and surprizing Cures it has performed. *England* indeed abounds in these Kinds of mineral Springs ; which Abundance affords us the Happiness to pick and chuse. But before we proceed to consider, for what Disorders this Water is salutary, we shall first subjoin what *Hoffman* says on this last-mentioned Purging-water at *Sedlitz* ; that so his Experiments and Remarks may lie ready at hand, for my Readers to compare with those made by me on that of *Llandrindod*.

“ There are other medicinal Springs, which
“ can be neither reckoned among the *Acidulæ*, *Thermæ*, nor Steel-waters ; but are
“ of their own peculiar Nature ; and contain
“ a pure, neutral, bitter, purging Salt. These
“ Kinds of Springs are very rare in *Germany* ;
“ and none of them known to this Day, besides those which I some Years since discovered at *Sedlitz* in *Bohemia* ; and after,

“ having carefully examined their Principles,
“ taught their Use, and introduced them with
“ good Success.

“ Before I came to examine this noble
“ Water, it had never been of any domestic
“ Use : Only there ran a Rumour among
“ the Inhabitants, that half a Pint of it wou’d
“ purge. There was this remarkable ob-
“ served of it, that tho’, in the Winter, and
“ in rainy Weather, the Spring flowed much
“ freer than in the Heat of Summer, yet it
“ always retain’d the same Taste ; and, as I
“ afterwards found, the same Virtues, and
“ Quantity of Salt. For an Instruction to
“ others, who may happen to be less versed in
“ the Examination of unexperienced Springs,
“ I shall here deliver my whole Procedure
“ on this Occasion.

1. “ I first poured a Quantity of the Wa-
“ ter into a clean, crystal Glass, where it
“ appeared perfectly limpid ; but to the Taste
“ proved remarkably bitter and saline. 2. I
“ then let fall into it a few Drops of the
“ stronger Acids ; such as Spirit of Vitriol,
“ Spirit of Nitre, &c. but perceived no Signs
“ of any Ebullition : And as it turned not
“ green with Syrup of Violets, I was hence
“ well assured it abounded with no alkaline
“ Principle.

“ Principle. 3. It did not turn Purple upon
“ mixing with Galls ; which shewed it con-
“ tained no irony Substance. 4. Upon mix-
“ ing with Oil of Tartar it grew somewhat
“ thick ; as generally happens when any
“ chalky Earth is harboured in Water. 5.
“ Upon a slow Evaporation of 12 Ounces
“ thereof, I obtained two Drams of a bitter
“ neutral Salt, like that in *England* called
“ *Epsom* Salt.

“ Upon the Strength of these Experiments,
“ I recommended these Waters to the Phy-
“ cians near the Place ; to be used instead of
“ the rough and coarse Purgatives of the
“ Shops ; and intreated them to go upon a
“ fuller Discovery of its Virtues : But scarce
“ any one of them thought me worth their
“ Attention ; till a very favourable Opportu-
“ nity happened to establish the Reputation
“ of these Wells. For, in the Spring of the
“ Year, 1721 ; when the Empress came to
“ the *Caroline* Waters, she made use of those
“ in *Sedlitz*, in the Presence, and by the
“ Advice of her chief Physician, whom I had
“ acquainted with my Discovery ; and before
“ whom I afterwards repeated my Experi-
“ ments : Upon which we, with Caution,
“ gave of the Waters to Persons labouring

“ under intermitting Fevers, and to great
“ Advantage. This excellent Phyfician af-
“ terwards returning to *Prague*, along with
“ the Emprefs, recommended this Water to
“ the Nobility of *Bohemia*; upon which an
“ immense Quantity of it was fent both to
“ *Prague* and *Vienna*; where it was fully
“ proved for purging advantageoufly, and
“ ftrengthening the Stomach. And in the
“ Autumn following, the Nobility and Gen-
“ try of *Bohemia*, who yearly flock to the hot
“ Wells at *Toplitz*, drank thefe purging Wa-
“ ters with great Succefs. And now the
“ Fame of them reached to *Dresden*, *Berlin*,
“ and others of the moft confiderable Cities;
“ where at prefent they ufe the *Sedlitz* Wa-
“ ters as common as thofe of *Egra*.

“ But as the principle Virtue of thefe Wa-
“ ters refides in their Salt; and as the Car-
“ riage of them to diftant Places is trouble-
“ fome and expenfive; I perfuaded a Chemift
“ of *Toplitz* gently to evaporate the Water,
“ fo as to attain its pure Salt for public Sale;
“ And the Event proved anfwerable to our
“ Expectation; for he now yearly difpofes
“ of very large Quantities thereof; and fends
“ it to diftant Countries.

“ The

“ The Character of these Waters being
“ thus established, I went upon examining
“ more narrowly into the Nature of the Soil
“ adjacent to the Spring; and the Search was
“ attended with this Advantage, that we discovered another Spring near *Seydschuz*, not
“ far distant from *Sedlitz*; but it lies somewhat higher; flows in Plenty; and has a
“ bitter and more saline Taste. And it seems,
“ upon the whole, unquestionable, that this
“ Spring runs down to, and supplies the Waters of *Sedlitz*. The Principles however of
“ this Spring, and the Nature of its Salts,
“ differ not from those of the other: For,
“ upon Examination, they both exhibit the
“ same Phænomena; tho’ the latest discovered
“ affords the largest Quantity of Salt; twelve
“ Ounces of this Water yielding two Drams
“ and ten Grains of Salt, and fix of a chalky
“ Earth. The Reason seems owing to this;
“ that the Spring, which lies higher, is less
“ exposed to the Reception of the Rain-water, than that of *Sedlitz*; which lying lower
“ may be easily weakened by the Rain, or
“ the Admixture of other Water.

“ As this Salt has a great Relation to that
“ called *Epsom* Salt, we will deliver the Experiments we made on both; the better to
“ manifest

“ manifest the peculiar Nature of each. The
“ learned Dr. *Crew* was the first, who, from
“ the Waters of *Epsom*, prepared such a kind
“ of bitter, purging Salts ; and wrote an ele-
“ gant Treatise on the Subject. But as twelve
“ Ounces of the *Epsom* Water will not afford
“ above half a Dram of Salt, 'tis certain that
“ the Salt, which commonly goes by the
“ Name of *Epsom* Salt, and is sent into foreign
“ Parts, in large Casks, and sold for less than
“ Six-pence *per* Pound, cannot be prepared
“ from those Waters ; but is rather an artifi-
“ cial Thing. And in fact it is not only pre-
“ pared in *England* from the Bittern, or bitter
“ Liquor that remains after the making of
“ common Salt ; but also at *Leipsick*, and
“ other Parts of *Germany*, in very large Quan-
“ tities. And it appears plainly, that a cer-
“ tain aluminous Acid, mixed along with the
“ alkaline Earth of common Salt, is contain-
“ ed in the Bittern which affords it. But 'tis
“ remarkable, that all Salt-springs do not
“ yield this neutral purgative Salt ; perhaps
“ only because the Salt-waters do not run
“ upon Beds of Alum-stone.

“ 1. The *Sedlitz* Salt is of an opaque, snow-
“ white, or milky Colour ; but the *Epsom*
“ Salt more transparent and watery : Whence
“ its

“ its greater specific Gravity, and Disposition
“ to relent in the Air. 2. The *Sedlitz* Salt,
“ whether in a solid Form, or dissolved in
“ Water, tastes much bitterer, and more nau-
“ seous than the *Epsom*. 3. Both of them,
“ when thrown into an ignited Crucible, melt
“ and lose one half of their Weight in a wa-
“ tery Vapour ; but the *Sedlitz* Salt flows clear
“ and thin like Water ; whilst that of *Epsom*
“ is more viscous and tenacious. 4. Neither
“ of them in the least dissolves with the high-
“ est rectified Spirit of Wine. 5. Both of
“ them melt, along with Pot-ash and pow-
“ dered Charcoal, into a Mass like the *Hepar*
“ *Sulphuris* : But the Mass thus made by the
“ *Epsom* Salt, turns with Water of a much
“ deeper green Colour than the other ; and
“ when the Solution is precipitated with an
“ Acid, affords a much larger Quantity of
“ *Lac Sulphuris*. 6. Both of them, when
“ mix'd with Vitriol, calcin'd to Redness,
“ and put into an ignited Crucible, yield a
“ Vapour like that of Spirit of Salt : And this
“ Vapour is soon followed by that of the vo-
“ latile Spirit of Vitriol. 7. The *Sedlitz* Salt
“ turns Syrup of Violets green ; but the *Ep-*
“ *som* Salt alters not the blue Colour of the
“ Syrup.

“ Syrup. 18. A Solution of either coagu-
“ lates with Oil of Tartar ; so that scarce any
“ Thing falls out when the Glass is inverted:
“ But the *Sedlitz* Salt coagulates strongest.
“ 9. In like manner, a clear Solution of ei-
“ ther becomes very turbid upon the Addi-
“ tion of Spirit of Sal Ammoniac ; and af-
“ fords a large Quantity of curdly Matter.
“ 10. An Ounce of Water will dissolve an
“ Ounce and two Scruples of *Sedlitz* Salt ;
“ but only an Ounce of the *Epsom*. 11. A
“ rich Solution of the *Sedlitz* Salt appears of a
“ yellow Colour ; whilst that of *Epsom* Salt
“ remains limpid, without discolouring the
“ Water. 12. The Crytals they both afford
“ by Solution, and Evaporation, scarce differ
“ at all ; except that those of the *Epsom* Salt
“ are larger and more beautiful, in some sort
“ resembling Nitre. 13. The *Epsom* Salt,
“ being kept for some Days upon a Sand-
“ heat, loses its Transparency ; and becomes
“ in Appearance like that of *Sedlitz*. From
“ all which 'tis manifest, that these two Salts
“ have a great Affinity, as well in their Prin-
“ ciples, as their Nature and Virtue.

“ The Experience of such as have drank
“ these *Sedlitz* Waters, confirms them ser-
“ viceable for washing off all crude, viscid,
“ acid,

“ acid, bilious and corrupted Humours, lodged
“ in the Stomach and Intestines ; and this in
“ so safe, easy, and agreeable a manner by
“ Stool, that nothing seems better disposed,
“ or more effectual for the Purpose. Other
“ medicinal Waters, tho’ they move the Bel-
“ ly, yet require to be drank in large Quan-
“ tities before they will operate, and therefore
“ easily pall the Stomach : Whereas these
“ operate quick, and in a small Dose ; so
“ that three or four Tea-cups full generally
“ prove sufficient ; and the strongest Con-
“ stitutions scarce require more than a Pint.
“ There is also this Property attending these
“ Waters, that they require not to be used
“ for any long Time, but only for eight or
“ ten Days at most ; and that too intermedi-
“ ately. And as they exceed other purging
“ Waters in the Quickness and Efficacy of
“ their Operation, so their Wholesomeness
“ and purgative Virtue recommend them be-
“ fore all other purging Medicines in Use ;
“ scarce one whereof but, operating more or
“ less than was intended, weakens the Pa-
“ tient, gives him a Sickness at the Stomach,
“ and lessens his Appetite : Whereas the *Sed-*
“ *litz* Waters, tho’ they purge briskly, have
“ none

“ none of these ill Effects ; nor occasion
 “ Dryness of the Mouth : But rather by their
 “ Bitterness relieve the Stomach, and provoke
 “ the Appetite. We can therefore assuredly
 “ affirm, that there is not in any Dispensa-
 “ tory, nor in all the Catalogue of Drugs, a
 “ Purgative that operates with such Safety,
 “ Efficacy, Agreeableness, Quickness, and
 “ Certainty as these Waters. In hypochon-
 “ driacal Disorders, I never found any Thing
 “ so serviceable ; and have known several,
 “ who, after remaining highly costive for
 “ many Years together, were perfectly re-
 “ lieved by the Use of this Water. These
 “ Waters are also found eminently serviceable
 “ in ill Habits of the Body, Obstructions of
 “ the menstrual Discharges, in scorbutic Cases,
 “ in the Piles, Worms in the Body ; and in
 “ short, for curing and preventing many
 “ other Distempers, if drank with the neces-
 “ sary Caution. *Hoffman*, from p. 88 to
 “ 92.”

The Pump-water of *Llandrindod* will be found an excellent Remedy ;

1. In the Scurvy ; and tetters Eruptions.
2. In that hypochondriac Malady, which comes from too great a Quantity of Juices, causing

causing Obstructions in the Liver, and other Viscera, by their Plenitude and Viscidity.

3. In the Morpew.

4. In Fevers ; particularly in such as are called Fevers upon the Spirits.

5. In the Leprosy.

6. In all such Maladies as proceed from impure and corrupt Juices,

7. And in several Species of the Gravel.

1. The *Scurvy* is a Disorder that baffles the Skill of the medical Professors in general, here in *Great Britain* : Nor have they rightly determined what its characteristic or pathognomonic Signs are. Some give it such a Latitude, as to take in almost all the Symptoms of Disorders incident to Man. Others again, confine it to that, which usually appears and rages in Camps, or at Sea. I do not intend to enter into a Controversy on this Subject. But thus much I confess, that I deem nothing to be Scurvy, but what is attended with Defæcations of the Skin, without any acute Fever ; or where there are small Ulcers in the Gums, that cause loose Teeth, fœtid Breath, and ouze out a stinking, slimy Matter. Where either one or the other of these related Indications ; or where they both together appear ; that I call

call a Scurvy : And of this Disease I am here treating ; and no other.

The Scurvy I am here speaking of happens generally to such Habits as have rich Blood, and a Plenitude of Juices ; and proves a Correction or Punishment to such as indulge themselves too much in high Living ; where the natural Discharge of the excrementitious Matter, or Dregs of the Aliment is wanting ; but particularly where Perspiration is impeded ; because that Evacuation, as it is equal in Quantity to the rest, so it is as necessary to the human Body. In an Impediment therefore of this Kind, the Ducts, thro' which the Juices circulate, and to which they communicate their nutritive Qualities and Effects, become overloaded, and obstructed by a glutinous or slimy Matter ; which ought to have been discharged thro' the Pores of the Skin. Hence it is, that the Sailors are so liable to the Scurvy ; because, from the Nature of their Food, they are most commonly costive ; and from the moist saline Sea-Air the Office of Perspiration is constantly prevented and interrupted.

But the Sailors are not the only People that are liable to this Disease. All Degrees of Mankind may contract their Share of it ; especially

pecially rich and high Feeders, who also indulge themselves in a sedentary Life. For by the first, Humours are amassed ; and by Inactivity, Perspiration becomes sluggish : Which Causes as certainly dispose the Body to Obstructions, as the Sea-water does the Sailor's. For Exercise, to promote Perspiration, even to a Degree of procuring a breathing Sweat, is as necessary to our Constitutions to preserve Health, as Food and Cloathing are to our Bodies, to nourish, and to keep them warm.

Ulcers, or an Herpes on the Legs, or any other Part of the Body, proceed sometimes from the same Cause ; and oftentimes from the Relicks of other Distempers, as Fevers, or the Small Pox, &c. These, for want of sufficient Purgation, lurk many Years in the Habit, and contaminate the Blood, before Nature exerts herself to make those Outlets to carry off the Superfluities : In all these Disorders, we venture to call our *Llandrindod* Water a sovereign Remedy ; because its purgative Contents are by the æthereal, elastic, volatile, mineral Spirits conveyed thro' the smallest Meanders the Circulation is performed thro' ; which dissolve and discharge

O

the

the Matter, that causes the Obstructions, Eruptions, and Ulcers.

9. We have already observed, that the *Hypocondriac Malady* has its principal Seat in the Liver, and other Viscera of the lower Belly. The Effects this Disorder produces in the human Body are terrible : Such are Palpitations in the Heart, Vomiting, Fainting, sometimes Convulsions, Inflations, and Tention of the Hypochondria ; with a Train of many other painful Afflictions. These various Phænomena appear, just as the superfluous Matter, or *Fomes morbi*, happen to be flung on this or that Viscus ; which moreover, pressing upon the Nerves, or contaminating their Juices, interrupts the free and liberal Circulation of the animal Spirits, and thus excites various Passions of the Mind, and those very different, according to the Nature of their Interruption, or irregular Influx and Reflux ; such as Fear, Anger, Low-spiritedness, great Anxiety, &c. which give Occasion to innumerable Suicides. We advise the poor Sufferers to repair to these Wells for Relief. Here they may drown this Chaos, this Multiplicity of Afflictions. The Obstruction cannot be so gently attacked, as is requisite, with Shop-compositions ; as the obstructed Organs cannot bear the violent Shocks

Shocks of chemical Preparations. I doubt not but some will be startled, to hear an Assertion of this Kind, from one who makes Chemistry the chief Part of his Profession: But this is very worthy Remark; that Physicians, the more they are acquainted with that Science, the less they prescribe chemical Medicines; as those that are most ignorant of Chemistry act the contrary. My Readers will easily see I am one of those, that prefer these natural Remedies: Which, in this last-mentioned Disease in particular, are so efficacious, that I deem them given by the Deity as a peculiar Blessing to those who labour under hypochondriacal Affections. When the Waters are prescribed for this Disorder, they must be used more cautiously, than in any other Disease they are ordered for.

3. The *Morpheæ* is a Disorder, where the Eruptions are confined to the Breast; sometimes in small livid Spots, like the Scurvy; at other Times, and more frequently, in yellow Freckles, and tawny Marks. It is remarkable, that, when these Eruptions are repelled by any outward Application, either an Asthma, or Pain in the Breast ensues; and, at certain Seasons of the Year, it is attended with Shiverings, feverish Heats, and great Anxiety.

From these, and other concurring Symptoms, it seems to be plain, that the Cause of this Disorder is owing to Obstructions of certain Vessels of the Breast, or Hardness of the Glands in these Parts of the Body. Drinking this Water, in the common Way, for a short Time, has by Experience been found a safe Remedy.

4. In some Stages of *Fevers*; but in particular in that slow one, called, the *Fever upon the Spirits*; these Waters are of great Utility. *Hoffman* was the first that recommended these natural Medicines in intermitting Fevers; and gave them with singular Success. But to slow nervous Fevers this Water seems to be most peculiarly adapted; because in these the Stomach is most to be regarded; which is very weak, being loaded with a certain fizy noxious Matter, which, if attacked by Vomiting, returns as fast as the Vomit discharges it. This Water then, in these Disorders, purges and discharges this Matter advantageously; and strengthens the Stomach; by which Means the enervated Constitution will be soon nourished, and the Fibres restored to their former Elasticity: Nor must we forget the great Facility these Waters have to pervade the smallest Tubes; and the great Benefit we may expect from them as a Deobstruent; the minute

nute capillary Vessels being here generally obstructed. It ought not to be forgot here, that this Water is an excellent Remedy in most Cases of the Small Pox, both as an Alterative and Purgative.

5. In the *Leprosy*, this Water has proved itself a most efficacious Remedy. Certain Circumstances will not permit me to relate Particulars; but the Reader may be assured, that many have been cured by its internal and external Application. It stands beyond Contradiction, that no Water, by way of a Bath, would demonstrate more salutary Effects, was it used in Bathing. Hitherto, indeed, there is no such a Conveniency at *Llandrindod*; but I hope in a short Time this Deficiency will be supplied, and we shall have the Pleasure to see some Baths erected; especially as Water is not wanted for this Purpose. But as we design to treat of Bathing in the next Book, under the Sulphur-water; which ought to mix with this in making the Bath: We will wave it at present, and speak more largely of it hereafter.

The *Scrofula*, or King's Evil, is a Disorder, which, to my certain Knowledge, has, more than once, been cured by this and the Sulphur-water taken in Conjunction: Nor need we

longer wonder at it, when we view them in their true Light, as purifiers of the Blood of the first Class. But of this also we will be particular in the next Book, on the Sulphur-water.

6. Many are the Disorders, that proceed from *impure and heterogeneous Juices* ; such indeed being Concomitants with all chronical Diseases. But here we shall only speak, under this Head, of such Impurities, as proceed from a costive Habit ; which, with the Acid Crudities of the *Primæ viæ*, commonly are the Beginning of the Diseases : Which we may reasonably conceive happens thus. In a costive Habit of Body the Excrements, as every one knows, are hard ; and the Moisture that ought to discharge itself with the Excrements, is again and again taken up by the Laws of Circulation ; with which, each Time, a great deal of terrestrious Matter is carried into the Mass of Blood ; and so the Foundation is laid for chronic Diseases, which in Process of Time terminate in various Shapes. Tho' the Subject may sweat and perspire freely, yet he cannot be supposed to discharge all the terrestrious Particles, thro' these small Emunctories. To such then as are addicted to Costiveness, we can recommend nothing

better

better, than the saline Water at *Llandrindod*; which will bring their Bodies into a proper Temper; and thus, by taking away the Cause, the Effect will be prevented. Many other Diseases might be brought in here. Such are those, where the Dregs of the Small Pox are not sufficiently purged off; which, for a Series of Years, may make the Constitution miserable; or the Leaven of juvenile Sallies, which all the Art of Healing, with the joint Aid of chemical Inventions, hitherto has not been able to root out and destroy; yet in these natural Remedies, we find our Wants of effectual Medicines copiously supplied. In some Disorders, and most commonly in these, the Skin is like a Parchment; and the perspiratory Ducts so much closed up, that it would be unreasonable to expect a deobstruent Quality, equal to our Purpose, to exert itself, at this great Distance from the Heart, in Internals only. It is therefore absolutely necessary, in order to effect a complete Cure, to bathe in these saline Waters, without any other Addition, made Milk-warm. This will soften, dissolve, and discharge the glutinous Lensor, that is lodged, and blocks up the Pores of the Skin.

7. In the *Gravel*, we may take it for granted, that various are the Causes that bring on the Disease, but a Relaxation of the Vessels is as general as any ; because the Elasticity of the Vessels being lost, a Force sufficient to propel the Urine into the Bladder will be wanted : Hence we need not wonder, why a Precipitation should ensue in the Kidnies, and the Passages appertaining thereunto. To this Kind of Gravel they, most commonly, are addicted ; that lead a sedentary Life ; and more so, if they drink, and indulge themselves in the Use of Malt Liquor. As therefore it is evident, that our saline Pump-water wants no diuretic Property ; and as its solvent Power cannot be questioned ; it is very natural to expect, that it will dissolve the terrestrious, fabulous Matter in the Kidnies, and discharge it, together with that unnatural Mucus, that obstructs these Passages. Common Water is even the Solvent of the nephritic Calculus : It then must be much more so, when endowed with a neutral Salt of a dissolving Quality. But in this Case this Water must be used cautiously. Small Doses in the Beginning, with a long Continuance, must be insisted on. Nor will any thing more be required, to
brace

brace the Veffels, and prevent a Return of the Difeafe.

Thus much may be fufficient to afcertain in what Diforders this Water is beneficial. Much more might be faid ; if it were neceffary, and our Affairs at prefent would permit. All that we have hitherto laid down, is drawn from real Facts, cloathed only in a plain, fimple and natural Drefs.

As to the Time the Difcovery of this Water was made, I can give no Account ; but the Tradition about *Llandrindod* is, that the Pump-water was in medical Ufe about fixty Years ago ; but for what Diforders no one can tell. This Water afterwards lay many Years quite ufelefs ; as it could not be employed for domeftic Service ; till the prefent Tenant's Wife, about twenty Years ago, brought it into Vogue again. Since which Time it has done Abundance of Service, in the various Diforders above enumerated ; fo that every Year its Vifitors encrease.

The fame Woman, that brought this Water into Ufe again, is alfo the Discoverer of the Sulphur Spring ; and has hitherto been the Directrefs of all the medical Spaws at *Llandrindod* ; and is very well known by the name of Mrs. *Jenkins*.

C H A P. III.

Directions for using the saline Pump-water at Llandrindod.

WE shall next consider and explain, how this saline Water at *Llandrindod* ought to be drank ; because, in most Cases, a peculiar Management is requisite ; without which, the most beneficial Thing in the Universe would be rendered useless. I am convinced, that an Error in this Point has been frequently the Cause of bringing a great many noble natural Medicines into Disrepute ; and have Reason to believe, that the Waters of *Landrindod* (altho' they are very much frequented)) would have gained considerably more Reputation, under proper Regulations and Restrictions. I will therefore, in this Chapter, endeavour to give the most minute Directions ; chusing rather to seem prolix, than to be deficient, in a Subject of such great Utility. But before we proceed to Particulars ; we shall recommend a few general Preliminaries.

1. Let me caution every one, that perceives himself afflicted with any of the Disorders enumerated in the foregoing Chapter, in which this Water has been pronounced salutary,

tary, not to tamper much with other Remedies ; such as chemical Preparations, or the noted mercurial Deobstruents. These grand Purifiers of the Blood, and powerful Removers of all chronical Disorders, often commit great Ravages in the Constitution, whilst the Disease gains Ground. Let the Patient therefore rather repair, with all possible Expedition, to this natural Fountain of Health. But where some Appearances, or unavoidable Necessity, have rendered such Remedies requisite ; in that Case, it may be adviseable to stay some Time, and not venture upon a Journey, or the Waters, whilst those Medicines remain mixt with the Juices ; because such hasty Proceedings, oftentimes, bring on new Disorders, more difficult than those we had before to combat with.

2. Let those who have once resolved to visit this Spaw, examine and weigh the whole State of their Disorder ; recapitulate every Incident that befel them ; observe what agreed or disagreed with them ; what they found Advantage by, and the Reverse : And if they have been under the Hands of any of the Faculty, let the Physician be consulted again, about a proper Regimen for the Use of these Waters, and about such Remedies as any Way proved

proved serviceable to them, by giving them Relief, or alleviating their Pains. Such Remedies ought to be noted; because they may be advantageously used, as Aids with the Waters.

3. Let not the Person who makes use of these Waters propose to himself too short a Time, and think, that two or three Weeks will be sufficient. No; let every one consider, that the Matter of a chronic Disease is so interspersed thro' the whole Frame, and becomes so much a Part of it, that the Disease itself (without deviating from Propriety, or Strictness of Expression) may be said to be *Constitutional*. How difficult then must it be to dislodge an Enemy so deeply intrenched? What Time will there not be required to follow it thro' all the minute Passes and lurking Holes, to be met with in the human Machine? And what farther Time to expel it? For were its Forces only to be stirred up, and not radically extirpated, they might create such Commotions in the Constitution, as would unavoidably prove its Overthrow.

4. Let them lay aside all manner of Business, that they may not in the least be interrupted, or taken up with any Concerns, during

ing their Stay at the Wells. For as the animal Juices are already, in all chronical Disorders, sufficiently corrupted, and irregular in their Motions ; it is therefore absolutely necessary to avoid, at this Juncture, every Thing that will create fresh Disturbances, either by raising the Passions, or depressing the Spirits. Before the Water has fully done its Duty, the least Irritation will cause deep Impressions ; and may set the Humours too much on Float ; and rivet and fix them in the Habit.

5. The Time for drinking these Waters is, by common Practice, confined to the Summer ; and undoubtedly this is the most convenient, and best Season to drink them, whether as a Preservative, or for any other Purpose ; but as they are efficacious in relieving Diseases any Part of the Year, so every Part is seasonable : And in Reality these Waters are, from the Middle of *March* to the Beginning of *November*, in their highest Perfection. Whenever therefore Necessity requires their Assistance, it would be imprudent to delay ; since the Distemper will not be so complaisant as to retard its Motion, and time its Assaults exactly with our Pleasure or Caprice ; but may perhaps have corrupted the whole Habit, before the elected Season approaches.

6. The

6. The Journey to these Wells ought to be perform'd with all imaginable Ease and Freedom. No Bleeding, nor any Kind of Medicine, should be premised before setting out : For it would be absurd to bleed and purge before the Patient leaves his accustomed Air, when we do not know how an Atmosphere, to which he is unaccustomed, will agree with him. May not the Change of Air, together with the Journey, have an uncommon Influence over him, or exert some sudden Effect? And if they should, from what Source must he expect that immediate Relief which is requisite on such Occasions. Phlebotomy, and Cathartics, have been previously used as Preservatives ; and the Constitution will not bear such frequent Harasses. Reason therefore will teach us, not only on this, but on several other Accounts, that we ought not to think of Bleeding and Purging, until we arrive at the Spot where we intend to drink the Waters.

Having thus settled Preliminaries, and conducted our Patients to the Fountain-head ; we will proceed to give them particular Directions to be observed on the Spot ; and shew ;

1. What general Evacuations are to be preparatively used.

2. What

2. What Method is to be pursued in the Course.

3. What Regimen or Diet is to be observed.

4. Some necessary Regulations and Considerations, concerning the Distempers and Revolutions that may possibly arise during the Course.

5. What Management is requisite after the Course.

6. Some Effects, that remain, after the Use of this Water only.

7. What Subjects ought to bathe in this saline Water.

8. How to guard against the bad Consequents attending Baths ; and some Rules necessary to be observed after Bathing.

1. *What general Evacuations are to be preparatively used.*

As soon as the Patient is arrived at the Fountain, and has made Choice of his Lodging ; let him consider, whether his Body has been lax or costive, during his Journey. If costive, let him take a Pint of the Pump-water going to Bed : But if he is otherwise, and Nature has had its due Discharge, it may be omitted. Next Day, somewhat early in the Morning,

Morning, about nine or ten Ounces of Blood ought to be taken away. A few Minutes before Bleeding, let him drink a Quarter of a Pint of the Pump-water ; and while the Blood is running, take now and then a Spoonful of this Water ; which will prevent fainting, and also make the Blood issue more briskly.

As there is no Rule without an Exception ; there is no doubt but some Constitutions cannot bear Bleeding. This Point being settled ; the Place of Bleeding, whether in the Arm, or Leg, must be left to the Discretion and Determination of the Physician ; who is to take his Indications from the several Circumstances of the Patient. But we apprehend, that there are but few Cases and Constitutions, to which the saline Pump-water is adapted, that cannot bear Bleeding.

In some Cases, Cupping is most adviseable. This again, is too particular to admit of certain Rules, any farther than this ; that, in a Morpew, or where a Patient is inclinable to Corpulence, Cupping is certainly of far greater Advantage than Bleeding ; because it irritates the smaller Vessels ; sets them in Action ; and enables them to perform their excretory Functions : But then Cupping must be repeated

peated every other or third Week ; whereas Bleeding is seldom requisite more than once in a whole Course.

That Day the Bleeding is perform'd, none of the Water is to be taken. But next Morning, let him begin with half a Pint before Breakfast, then half a Pint between Breakfast and Dinner, and half a Pint when he goes to Bed : And the succeeding Morning let him take, every half-Hour, an half-Pint Glass, till it purges him briskly ; and then we may deem him properly prepar'd for a Course of these Waters.

2. What Method is to be pursued in the Course ?

Here it will be necessary to premise, that this Water should be drank out of long narrow Glasses, and so swallowed gradually ; by which Means the æthereal, volatile ; elastic Spirits will diffuse themselves with more Facility thro' the minutest Vessels, and open the Passage for the Water and its salutary Contents. The scorbutic Patient having observed the before-mention'd *Generalia*, and being now enter'd upon the Course, must use this Water, both purgatively and alteratively. As an Alterative, it is certainly none of the meanest ; as it sits easy on the Stomach ;

P

strengthens

Strengthens and warms it ; increases the Appetite ; and promotes Digestion ; and renders the Person brisk, lively, and vigorous.

The Quantity to be taken, whether as a Purge or an Alterative, cannot be well ascertained, till the Case, Age, Sex, Habit of Body, and other Circumstances have been duly considered ; because some are hard to be work'd, and others will be moved with a little Matter : But generally, scorbutic People are bound and costive. Upon the whole, every Body knows his own Constitution ; and, of Course, is sensible, whether much or little be required to work him. As a Purgative, they must take so much of this Water as will procure about four Stools : As an Alterative, no more than about one Motion, or two extraordinary, in 24 Hours.

At a Medium, for Adults, the Quantity is about three Pints a Day, by way of Alterative ; which is to be regulated in this Manner. About one Pint and half should be taken in three Doses, leaving 15 Minutes Distance between each Dose, in the Morning before Breakfast. About an Hour before Dinner, another half Pint. Another half Pint about Six o' Clock in the Evening : And at Night, when he goes to Bed, the same Quantity.

But

But if, with this Quantity, there is no easy and free Discharge of the Excrements, but the Patient remains whole Days without any Stools; then the Quantity of Water is to be encreased; so as to bring the Body to that Point. And, on the other hand, it must be lessened if the Evacuations are more violent than required, or exceed the limited Number.

Amongst the many and various Diseases inflicted on human Bodies, none require purging Physic so much as the Scurvy. It is well therefore, that we have the Blessing of these natural Purgatives, that do not weaken and enfeeble the Constitution. As Physic then, this Water ought to be taken twice a Week; in order to discharge the Crudities of the Distemper, that were soften'd, loosen'd, and put into Agitation by the Water, whilst it acted as an Alterative.

On those Days it is taken as Physic, it is best, if the Weather will permit, to take the Draughts, at the Fountain-head, of half a Pint each, and to walk or ride between them, till it begins to operate; and as soon as it has given two or three Motions, return to Breakfast: Afterwards the Patients should encourage the Operation, by drinking more of the Water in their Rooms. In order to make it

agreeable to the Stomach, they may take some candid Orange-peel, or other candid Aromatics, or a Glass of warm bitter Wine, or any like Medicine : For I would never advise them to drink it warm ; because they lose, by warming it, too much of its ætherial Spirits. After Dinner they should omit taking it, on these Days of Purgation, 'till they go to Bed ; when the usual half Pint must be drank.

Thus I would have the scorbutic Patient proceed, at least six or seven Weeks, or longer, if the Malignancy, or the Inveteracy of the Disorder requires it : And if the Eruption be very violent, Bathing must be joined ; as I shall observe in its proper Place.

Where there are Tetters, and Boils, bathing and frequent washing the Parts chiefly affected is still more requisite. The drinking Part is the same here with that in the Scurvy ; except that sometimes some other Remedies are joined with Success. In Cases of this Kind I have seen uncommon Effects from alkaliz'd Quicksilver, or Mercury, given with this Water. Sometimes Lime-water is not unserviceable, in order to assist in drying the superfluous Moisture ; and sometimes other Aids may suit the Constitution and Disorder better.

In

In hypochondriacal Affections, we must regulate the Use of this Water by another Method, to make it a suitable Remedy, because of the great Languor of Spirits, attended with Flatulencies, troublesome Eructations, great Debility in the digestive Faculties, Lassitude in all the Limbs, Head-ach, with many other Symptoms; which, together with the Obstructions seated in the Hypochondria, demand more moderate Proceedings, and more gentle Assaults, to oblige them to give Way. A frequent Change of Medicines is very detrimental in this Disorder. Such as act easily and freely, are the safest and surest. Bathing in this Disorder, as well as drinking the Waters, is not only serviceable, but necessary. At the Beginning, the general preparatory Evacuations are to be used; a due Regard and Circumspection being observed in respect to the Disease and Constitution. For by no Means must more be attempted, than the Patient can chearfully bear. Even where the Habit is costive, there it will be necessary, the Night before he purges, not only to take a small Quantity of the saline Water, but also to make use of a Clyster; that the obstructing Matter may be mollified, and the Intestines lubricated, and made to yield their Contents

P 3

with

with more Facility and Advantage. When thus, by fair and gentle Means, the Patient is prepared, let him proceed to use this Water as an Alterative.

The hypochondriac Patient being now arrived at the alterative Method of taking this Water, his Draughts must by no Means be so large and copious, as those prescribed in scorbutic Cases. Let his Glass be no bigger than a common-Wine Glass ; but let him drink often, that is, as much as will agree with him without purging. Let him, more than once, take a small Glassful between Meals ; and let it be the last Thing he does, when he goes to Rest.

As the Stomach, in this Disorder, is in particular affected, we may of Course imagine, that the cold Water will be very disagreeable to it ; yet we cannot by any Means comply with warming it. But to alleviate, as much as possible, this disagreeable Sensation, let the Patient make a Decoction of *Rhenish* Wine ; and infuse therein some warm Aromatics ; as the Roots of Zedoary, *Calamus Aromaticus*, Cardamon Seeds, dried Orange, fresh Lemon-peel, &c ; and let him, in the first three Glasses of Water he drinks, take a large Spoonful of such an Infusion, or a
Dose

Dose of *Tinct. Aromat.* which will settle his Stomach, and render the Water agreeable.

To purge, sometimes, is requisite ; but not so often as to the scorbutic Patients ; that is, never unless some obvious Indications shew it to be necessary ; as some apparent Fulness, or oppressive Load felt in the Stomach or Bowels ; and even in these Cases, the purging Use of this Water must be so adapted, that it operate in the mildest Manner. This the Patient may regulate himself, as soon as he becomes sensible how much his Constitution can bear ; for to promote three or four easy Motions will commonly be found sufficient.

When thus the Patient has drank the saline Pump-water for about three or four Weeks, he ought to bathe in Baths made of the Sulphur-water. Which bathing must be repeated every other, or every third Day, according as he maintains his Force and Spirits under its Effects : But, on the bathing Days, he must totally refrain from drinking the saline Pump-water.

The Morpew we must consider in the Light of an Asthma, that is expelled from the Centre to the Circumference, or from the vital Parts outwardly ; for, as soon as the Eruption is struck in, the Patient labours un-

der that Complaint. Cupping is so proper here, that it can hardly be dispensed with : To which, if the Patient is of a robust, sanguine Constitution, Bleeding must be added. After these Evacuations, he may proceed in the same Manner, as was before advised to the scorbutic Patient.

Where there is already an Asthma complicated with the Morpew, it is necessary to join some gentle warm Medicines with the Water ; as the Roots of Elecampane, Ginger, Flowers of Benjamine, Gum Ammoniac, mixt with grateful Stomachics ; as also at Night, when going to Bed, to take such Pectorals as, by Experience, he has found to give him most Relief. These soften and relax the clogged Organ ; and dispose it to yield its morbid Contents, when, the next Morning, it becomes warm'd and invigorated by the Medicine, and irritated by the Water.

Under the Term *Fevers* we comprehend all inflammatory Disorders, such as the Erisipelas, and the like. It were to be wished, that this Water was exported for the Benefit of those in the Small Pox. For I am very well perswaded, that was it, in that Distemper, used cautiously, first as an Alterative, it would facilitate both the Eruption, and Suppuration

puration in an eminent Degree ; and afterwards, was it taken instead of the usual Physic, we might expect almost unspeakable Advantages from it. — But I shall content myself with only hinting its Utility in that Distemper, and wave any further Prosecution of it for the present.

Whoever will use this Water in intermitting or nervous Fevers, commonly called *Fevers upon the Spirits*, must, in the general preparatory Evacuations, omit Bleeding ; and, instead of it, take a Vomit. Afterwards they should purge themselves with the Water, within the Space of two or three Days after the Vomit ; and then they may enter upon the alterative Course.

For an Alterative, let them drink three Pints in a Day, if their Constitution can bear it. But as all Kinds of Fevers have their proper Fuel or Supply, which must be discharged, they must purge freely ; and after a Week's Use of the Water, as an Alterative, let them begin again to purge twice a Week, and follow exactly the same Rules, and Directions, that are prescribed to the scorbutic Patient. Such as drink this Water for an Erisipelas-Complaint, must omit Vomiting ;
but,

but, in every other Circumstance, proceed as directed in the Scurvy.

In the Leprosy, it may indeed be considered, whether blood can be spared or not: But, generally, it is better not to bleed at all in this Disease; but to drink the Water longer, that is, every Day, so much as will cause two purging Stools. To this internal Course join Bathing twice a Week in a warm Bath, made of equal Quantities of Pump and Sulphur-water. Which Bath is to be enter'd upon, after three Weeks drinking the Waters: But on the bathing Days no Water must be taken inwardly.

In all Impurities of the Blood and Juices, let the same Rules be observed as are prescribed for the scorbutic Patient.

The Gravel, we shall here speak of, is such as is caused by a lax Fibre, or Weakness of the Vessels: So that the Patient has no Occasion to bleed; but let him prepare himself by purging well with this Water; and then drink daily no more of it than will plentifully work him by Urine; and purge afterwards once a Week. When thus the Gravel is discharged; let him take, every Morning, half a Pint of the Rock-water, with a half Pint of the Saline, for three or four Weeks more; and

and half that Quantity when going to Bed. By these Means the Disorder will be cured ; and the weak Vessels will be restored to their former Strength and Elasticity.

3. *What Regimen or Diet is to be observ'd, during the Course.*

The Diet ought to be rich and nourishing, yet simple ; which is a seeming Contradiction : However, we hope to be able to reconcile it. By the *Simplicity* of Diet, we understand a total Abstinence from Vinegar, Pepper, salted, or pickled Flesh, coarse leaven Bread, Cheese, Fruit, Salad, buttered Cakes, and every Thing that is of a heavy or a piercing Nature, or requires a long Digestion ; or that is prone to Fermentation, as Onions, Leeks, &c.

Altho' the Food be thus *simple*, yet it must be *rich* and nourishing ; because the animal Spirits require to be cherished and enlivened much more in drinking these Waters, than at other Times ; and the Stomach, in particular, seems to crave it. Therefore delicious Soups should be made so rich of the best of Flesh, that is, fresh and young, that they will jelly when cold ; to which a small Quantity of Salt may be added ; but no oil.

Some

Seasoning, except Parsley, Salary, Thyme, Hyssop, Scurvy-grass, wild Sorrel, &c. Let all their other Foods consist of Flesh or Fish. The Flesh must be fresh and young, dressed in the simplest Manner, and easy of Digestion. Of Garden-stuff, nothing ought to be used but Beans, Kidney-beans, Peas, Asparagus, and Artichokes. Potatoes, Turnips, Carrots and Parsnips, are likewise wholesome, if they all be well boiled : And they will still be more suitable to a sickly Constitution, if they are stewed in Broth, after they are boiled in Water. Too much Butter ought, by all Means, to be avoided.

As to the Beverage, or drinking Part ; it ought to consist of such Liquors as are most excellent, and delicate in their Kind. Malt Liquors may safely be drank, provided they be well fermented, have all their Ingredients good in their Kind, be well hopped, light and clear. But if the Malt Drink be muddy, sour, or clammy, it will prove highly pernicious to the Patient ; as it will not only retard, but totally prevent the Cure.

But the best of all Liquors is good Wine, mixt with Water ; and next to that, Brandy or Rum and Water. Punch I cannot greatly recommend. But whatever be the Drink the
Patient

Patient uses ; let him take Care, that it be the best, in its Kind, that he is capable of procuring. Nor is this to be deem'd Extravagance ; but the prudentest Frugality : For here, the old Observation holds good ; that the *Best* is the *Cheapest* ; as it is more benign and efficacious in its Operations, more extensive and satisfactory in its Effects, and more safe and salutary in its Consequents.

Sobriety and Temperance, both in Eating and Drinking, are at all Times necessary for the Preservation of Health ; and particularly requisite in a Course of these Waters. This is a Doctrine so well known, that barely to hint it may be judged sufficient.

Gentle Exercise, taking the Air, entertaining ourselves with cheerful Company, and the like Divertisements and Amusements, of which we have spoken more fully in the first Book, are also to be understood as equally useful here.

4. *Some necessary Regulations and Considerations concerning the Distempers and Revolutions that may possibly arise, during the Course of drinking these Waters.*

Generally, the Use of the Water encreases the Eruptions in scorbutic Patients, and creates
a more

a more violent Itching. Which happens, because the Humours being rendered more thin, and the Constitution and Energy of the Fibres being strengthened, and augmented, the *Fomes morbi* is flung upon the Surface of the Skin, faster than usual, or than it can be protruded thro' its Pores: Hence it is there accumulated, and causes greater Irritation and Inflammation. I shall not proceed to explain here, how the saline Quality in the Water may be alter'd by the various Changes and Mixtures it undergoes; and act as a Cause of this Symptom. This would lead me into too large a Field of Chemistry for the Subject I have undertaken.

Tho' this be a troublesome Symptom, yet it may be borne with Patience, as it is a Sign of recovering Health; and may be alleviated by a moderate Use of the Flesh-brush, and the Cure expedited by warm Bathing.

Sometimes the *Fomes morbi* is flung upon some particular Part of the Body, which is either naturally weaker than the rest, or where there is the freest Access, or most common Vent for the perspirable Matter; and the Eruptions are there accumulated; as upon the Feet, Legs, under the Hams and Armpits; from whence it must not be repelled; but Nature must be permitted to perform her Office. The Cause
of

of this is the same with the foregoing ; and it is always salutary. When it comes on, the Water must be drank as an Alterative, till it comes to a kind of Suppuration, or the Pustules are replete with Matter. It will then be proper to physic briskly every other Day ; of which Means Health will be the happy Consequent.

There is another Circumstance, which very frequently attends the Scorbutic, and indeed other Patients that drink this saline Pump-water, *viz.* a Giddiness in the Head. This most commonly happens to such as are accustomed to drink Malt Drinks, and other heavy Liquors ; because they produce viscid and sluggish Juices, hardly capable of passing thro' the exquisitely fine Vessels of the Brain and Nerves *. These viscid Juices then are, by the Use of this Water, attenuated ; on which they circulate more swiftly, and pervade the Vessels unaccustomed to such heterogeneous Bodies ; which affects the *Sensorium* with the Sensation here in question. But this is rather advantageous than dangerous ; and may be therefore suffered to take its Course : Or, if too troublesome, it may be alleviated, if not

* *Hoffman*, Page 161.

removed, by some gentle strengthening cephalic Herb-Snuff.

As this Water is serviceable in all Stages of Life, the Age of the Patient cannot be any Bar to its Use. It must work both by Urine and Stool. If this happens not, then all possible Means must be used, in Eating and Drinking, to bring the Constitution to a proper Temperament. All Liquors that contain a Sourness, such as Beer, Punch, Cyder, *Rhenish* Wine, and the like, are highly prejudicial under the Course; because they not only retard, but prevent the Evacuations.

If no natural Evacuation can be procured, by Means of this Water, and a cold Shivering, like the Beginning of an Ague-fit, comes on; it is a certain Indication, that this Water will not agree with the Constitution: Therefore its Use must be discontinued; and the Habit disburthened from it, by Vomits, Clysters, or the like. On the other hand, if a Laxity of the Fibres ensues, then the natural Astringents, such as the Rock-waters, are to be cautiously called in to aid. And if those avail not, then the artificial Astringents must be tried: But these must be of the mildest Kind; that the Patient may not be brought into an Atrophy.

5. *What Management is requisite after the Course.*

Here we are to direct those, who have happily completed the Course of Drinking these Waters. The scorbutic Patient then, that is blest with the favourable Indications of his Cure, must continue in the same Regimen and Diet, that he used when he actually drank the Waters, at least for three or four Months: If he can have the Convenience to carry a Quantity of this Water home, it will be adviseable to take a Pint of it every Morning before Breakfast; and also to cause to be made, every Day, with about half a Pint of the Water, or else with Broth, or Water-gruel, a strong Infusion of Scurvy-grass and Sorrel, to be taken before Dinner: By which Means he will so settle his Constitution, that his Blood will not be so soon infected or tainted again.

Such however as cannot have the Convenience of having this Water at their Habitations, let them, after they have finished the Course, take every Morning, before Breakfast, half a Pint of a strong Infusion, made of sharp-pointed Dock-roots, and Water Trefoil, in equal Parts, having first dissolved therein a Dram of Salt-petre; and before Dinner the

Soup above directed : From a Continuance of which, for about three or four Months, very salutary Effects may be expected.

Where there are Tetters and Boyls the same Method is to be pursued. It is proper to apply Repellents to such Sores as are not dried up ; and if, at the same Time, Astringents in these outward Applications can be brought in, the Cure will be facilitated.

In hypochondriac Disorders, no Medicines or Water should be taken afterwards. Only observe to keep an exact Diet suitable to the Temperament. Use constant, gentle Exercise ; and keep the Body open. As often as this last is wanted, take as much *Hiera Picra* as will give one or two Stools ; but not so much as will bring on a Purging.

In a Morpew we advise nothing, but a Regularity in the manner of Living ; and by no Means to run into any Kind of Excess. But if it should happen that any Touch of an Asthma should appear, then the emetic Wine and *Hiera Picra* may, as an Alterative, be advantageously used.

In Fevers, we suppose that the Dregs, after the Course is finished, are discharged : So think every thing, except Regularity and Exercise, useless.

In Leprosies, and Impurities of the Blood, we recommend the same After-management, as we have before recommended to the scorbutic Patient.

He that is relieved from the Gravel, ought now and then to take a gentle Dose of Physic, such as best agrees with his Constitution.

6. Some Effects that remain after the Use of this Water.

This, like all other mineral Waters, will sometimes shew its good Effects, long after the Course is completed. Those Patients therefore, with whom the Water operates by Stool and Urine, tho' they do not perceive any other Symptoms of Recovery, ought not to be dejected, but with Courage persist a sufficient Time in its Use; and notwithstanding no salutary Symptoms appear at the End, yet let them conclude regularly, and follow the Regimen prescribed, at least for four or five Months; wait with Patience the Effects, and not ruin their Constitutions with other Medicines. For we can hardly persuade ourselves, but that, if the Water has properly work'd by Urine and Stool, some Signs of restored Health will, at length, appear. But

I must earnestly intreat the expecting Patients to drink this Water, for a sufficient Time, at the Spring-head. He that is remiss in this Article, cannot, with any Colour of Justice, lay any Fault on the Medicine.

7. What Subjects ought to bathe in this saline Water only.

There is hardly a Distemper, where Bathing is beneficial, but a Bath made of the Sulphur-water alone would be serviceable in it: So that we might content ourselves, and be extremely well satisfied with that only. But the All-great and All-good Creator has been so bountiful, as to give us Plenty of three different Kinds of Water at *Llandrindod*. We therefore will endeavour to direct a proper Choice; and select here such Disorders, wherein it is most adviseable to bathe in the saline Pump-water only.

It has been disputed among the most able medical Writers, whether the human Calculus, or the chalky Matter that remains in the Joints after a Fit of the Gout, partakes of Salt or not. There are in this, as in all other controverted Points, two Parties, one on the affirmative Side, the other on the Negative.

But

But the Chemists, or Experimentalists, we apprehend, ought in this Article most to be relied upon : Amongst whom, those of the first Repute unanimously assert, that Chemistry hitherto has not been able to obtain the least Grain of Salt, or any thing like it, from the above-mention'd Calculus. The Truth of which Assertion we could corroborate with many modern Experiments, and give our Readers plain Conviction ; were it not that a full Discussion of it would be too prolix here, and draw us too far from our present Subject.

Persons that have the original Seeds of the Gout in their Blood, and happen to be afflicted with the Scurvy, have that Species, which is properly called the *Dry Scurvy*. What we mean here by the Dry Scurvy is, an Eruption that appears in large Blotches, bearing a scaly Scurf, of a white Colour, that will crumble into Dust, like Chalk, betwixt the Fingers : And altho' it breaks out but on very few Parts of the Body, chiefly on the Arms, sometimes on the Breast ; yet we may assure ourselves, that all the perspiratory Ducts are, in some Measure, obstructed by the same farrinaceous Matter.

This Kind of Scurvy cannot, in any Degree, be alleviated ; unless the external Use be joined to the internal, and the Bath consist entirely of the saline Water ; and this for several obvious Reasons. 1. As there is no Salt in this Matter, a Salt is required to dissolve and soften it ; that Water may be able to penetrate thro' the sudorific Pores, to cleanse and wash away this Filth, and render them pervious. (2) There is no Doubt, but that the Juices also next to the Skin are abundantly mixt with this chalky Matter. Hence, (3) Nothing but Water impregnated with a penetrating Salt, can have a free Access thro' the sudorific Passages, to correct and discharge it. (4) To prepare the Skin for the Eruptions, which by this chalky Matter were prevented ; and without which we cannot expect any real Benefit in this Case. And for many other Reasons more, too tedious to mention.

The next Disorders where the saline Water alone is preferable for a Bath, are the Gout ; wandering Pains in the Limbs, where the Blood is viscid and fizy ; and rheumatic Complaints. But if, in some Complaints, or to some delicate Skins, it should prove too saline or sharp ; it may be altered, and made weaker, either by the Help of common, or the Sulphur-

Sulphur-water, just as the Circumstances may require.

In order to prepare this Bath, which should cover the Body; six or seven Gallons ought to be made boiling hot; and then poured into the bathing Tub, to the cold Water; which on mixing will be sufficiently warm. The Water must not be too hot; Blood-warm, or heated to such a Degree, that the Patient can bear it easily on every Part of his Body, is the right Medium.

Before the Patient thinks of Bathing, he should at least for three or four Weeks drink the Waters, with that Regularity and Exactness that is recommended to scorbutic Patients; and then he may begin to bathe twice the first Week; and then, every Day, for ten or twelve Days successively.

In Disorders where we recommend this saline Water-bath, it is always best to use it, in the Morning early, before Breakfast. The Patient must by no Means stay so long in the Bath as to cause a Sweat; which as soon as he perceives approaching, he must come out: For, in these Cases, we should do more Harm than Good, did we drain off the Moisture, when our whole Intention in Bathing is, to add a saline elementary Liquid to the petrified

Juices, to dissolve and discharge them. If no Sweat ensues, the Patient may remain therein from twenty to forty Minutes : During which Time the Flesh-brush also may be advantageously used. But altho' Sweat is detrimental, yet the Patient must be in a perspiring Glow ; if not, he must leave the Bath, as he did on Occasion of the Sweat ; and go to Bed.

In the Bath, the Patient may take, if required, a Glass of Wine and Water, to refresh himself, or a Dose of Balsam of Life. (But the volatile Salts are to be avoided) And after he comes out of the Bath, let him go, for about half an Hour, to Bed ; or sit in his Easy-chair for the same Space of Time ; and then he ought to move gradually, and gently walk in his Room, for about another half Hour, before he takes his Breakfast.

Between Dinner and Breakfast, he must use very little Exercise. Let him not dine without good Broth, or Soup. Let his Victuals and Drink be warm, nourishing, and such as will afford mild soft Chyle : And indeed, on the Days he does not bathe, it would be better, if he eat or drank nothing cold, except the mineral Water.

After

After Dinner, the Patient may exercise *A-broad*, provided the Air be dry and warm ; otherwise, he must find himself Exercise within Doors. Dancing is to be preferred before any other, as the most salutary : But then I must caution him not to use it to Excess ; nor to that degree, as to promote Sweating. The Night-air must be avoided, as too cool. Finally, let him go warm to Bed.

In some Constitutions, cold Bathing may be adviseable, and, in some Measure, necessary ; as when the scorbutic Patient is much addicted to Night-sweats ; and where the Fibre or cutaneous System is lax, or much weaken'd. But whenever this cold Bathing is attempted, it must be under the immediate Direction of a Physician, that is acquainted with the Water, as well as with the Constitution of the Patient.

These are the most material Rules to be observed by those, who bathe in this Water. The rest are so well known, that I need not expatiate on them. As those I have laid down are attended with Ease and Safety to the Patient, I question not, but they will be readily embraced and complied with.

8. *How to guard against bad Consequents attending Baths ; and some Rules necessary to be observ'd after Bathing.*

We have already hinted, that no one should presume to go into this Bath, before the Eruption, or when it is coming out ; because it is attended with a Kind of Inflammation ; which the Salt would irritate, or perhaps repel to the Vitals ; of which we may easily guess the Consequence. We therefore presume, that no one will be so rash, as to make Use of this Water as a Bath, who has not first taken it inwardly a sufficient Time ; and waited for the Eruptions coming to a Crisis ; or till the Inflammation is past its Height. Many Children, that bathe in cold Water for the Rickets, are sent to the Grave for want of due Caution, and fit Regulation. The malignant Matter of the Rickets will terminate frequently in Eruptions : Now if the Bathing be used, when these Eruptions appear, Death is almost the certain Consequent ; of which many Examples might be produced.

Sometimes it happens, that fresh Eruptions crowd out upon Bathing. In this Case, the Bath must be used sparingly, not above once a Week instead of every other Day ; and
particular

particular Care ought to be taken, that the Eruption be not check'd. Drinking the Water, in this Circumstance, must be carefully attended to ; and the Dose must rather be encreased than diminished. And as, in this Case, the Blood abounds, most commonly, with a thin acrid Serum, that will fret and go into an Effervescence with Alkalies ; and in other Respects will act as an Acid ; it is therefore adviseable to join Absorbents, such as precipitated Coral, emetic Wine, as an Alterative, well prepar'd *Antimonium Diaphoreticum*, the alkalis'd Tincture of Antimony, and such like Remedies ; which will give new Force to the Water ; and wonderfully accelerate the Cure.

Aromatics, in the bathing Period, must be omitted ; because they are too hot, and may sometimes be the Cause of the secondary Eruption. The Stomach therefore must be refresh'd with Broths, Jellies, and other Kitchen-cordials. But oftentimes a voracious or canine Appetite comes on in the bathing Period ; and if that should happen, the Patient must labour to subdue it.

Sometimes the Bath will carry the Miasmata to the Head ; and cause Giddiness, Noise in the Ears, &c. In this Case, as soon as it

it appears, the Patient must cup freely, bathe less, and drink so much of the Water Milk-warm, as will purge him briskly every other Day for about four or five Times. Then let him resume the frequent Bathing again : And if it returns after this, let him bleed plentifully in the Foot. Cupping also and purging must be persisted in, and repeated at proper Intervals, till the Head is perfectly clear ; and by these Means an Apoplexy may be prevented.

It is no Wonder, that Bathing most commonly renders the Body costive ; because Perspiration is encreas'd ; and an Encrease of one Evacuation, is, according to *Sanctorius*, the lessening of another. In this Case there is nothing better than the frequent Use of Clysters, to promote the necessary Discharges : Or if this Method is disagreeable, and the Constitution strong enough, let the Patient take, on the bathing Days, at Night, when going to Bed, a large Tea-spoonful of *Elixir Proprietatis*, and about thirty Drops of emetic Wine, in half a Pint of saline Water.

B O O K III.

Contains a physical and historical Account of the Sulphur-water at Llandrindod, and Experiments on which the Contents of it are established; describes the Distempers, in which it is salutary; and lays down Directions and Rules for Drinking, Bathing, and all other its medicinal Uses.

C H A P. I.

A physical and historical Account of the Llandrindod Sulphur-water.

THE Sulphur-water, commonly called the *Black stinking Water*, receives its Name from the strong Smell it emits, and the black Dye the Current precipitates in its Passage; tho', if taken up at the Spring, 'tis as clear as other Water.

Almost

Almost all Waters that bear the Epithet *Sulphureous*, have the following characteristic Qualities in common. 1. They send forth a sulphureous Smell (from which they take their Names) something like the washing of a Gun. 2. They are cold. 3. Near the Spring-head they line the Sides, and all the Passage, with a white slimy Mucus. 4. They stink most in rainy Weather. 5. After a Drought, just before rainy Weather, the Spring rises with greater Impetuosity, than at other Times. 6. They instantaneously stop Fermentation. 7. They deposit or precipitate a black Sludge in their Passage. 8. They turn Silver, and other white Metals, first yellow, then black. 9. They kill Vermin, Worms, Caterpillars, &c. These common Characteristics are all to be found in the Water I am going to treat of.

The Soil or Stratum of the Bowels of the Earth, that Waters of this Kind spring up in, is of various Kinds. They are found in Limestone; in Slate; in a Marl-like Slate; in a blackish bituminous Earth; in soft red Freestone; in Clay, Bogs, or Turbaries. But the Matter, that makes Turf, is not the Cause of them: On the contrary, the same universal Ferment, that generates these Sulphurwaters, is also the main Ingredient in that Kind
of

of Fuel; the Exhalations, that come from this mineral Ferment, endowing the Turf with their phlogistic Qualities.

The whole Globe, or at least those Parts we have been able to examine in the Working of the Mines, are full of Sulphur, and bituminous Matter. The Sea-salt, or common esculent Salt, furnishes this Bitumen. Hence the Turf in low Countries is more excellent, and a better Fuel, in its Kind, than that, which is got in the Mountains. Hence too the Turf in *Holland* is preferable to any we know of; because the Sea-water can fecundate it, without obstruction. This is confirmed by the Observations of *Schoekius*, and other *Dutch* Naturalists: For in digging Turf, in *Holland*, many Leagues distant from the Sea, a perfect saline Water is frequently met with.

For farther Conviction, a common esculent Salt may be extracted out of all Turf; as well as a bitter purging Salt: Which latter could not there exist without the former esculent Salt, being the Mother of this bitter purging one. So that wherever we meet with considerable Turbary Bogs, we may safely conclude, that a briny Spring is not far off.

It is the same with respect to Coal: And were it not that it would carry me too far from my Subject, I could experimentally demonstrate, that when the unctuous Matter in Sea-salt happens to mix with sulphureous Marcasites, they excite, in the Bowels of the Earth, a Vapour; and where this Vapour impregnates a light subtile Earth, near the Surface, in a boggy watery Place, it then makes Turf; or if it meets with a soft Iron Ore, the Consequence is Coal: Thus the Effluvia, *ad Infinitum*, change variously the Subject, according to the Variety of Matter, on which they light.

This bituminous Matter in Sea, or Rock-salt, always appears to have the same Qualities. As long as it is combined with this Salt, it is very easily perceived; and always appears on the boiling or making of it. It emits a fine balsamic Smell; whence some Naturalists have called it a natural mineral Balsam. Its odoriferous Qualities encrease, and diminish, according as it meets with fine or coarse Minerals. For Instance, in Turf it is fragrant and agreeable: In Coal it is not so, but coarse and ungrateful, But let it be mixed with what it will, as long as it is predominant, it is no ways detrimental to the animal Constitution.

ution. Coal is still of its own Nature, but expanded in coarser Particles. For which Reason it is not detrimental ; as has been remark'd by *Stabl*, *Neuman*, and others of the first Class in Physic residing in *London* ; who have observed, that the Fumes of Coal are no ways the Cause (as has been suggested by many) of that endemical Consumption, that reigns in that Metropolis ; which is certainly owing to that astringent Liquor made so free with, and to the Alum the Bakers make use of in their Bread. These Astringents, (the Temperature of the Air contributing not a little) lessen the Dimensions of the circulatory Vessels, and thicken the Juices ; which, stagnating, cause Obstructions ; and terminate in this Disorder.

From the Uniformity then of this Bitumen in the esculent Salt, Brine, or Rock-water, we may venture to conclude, that it is the agitating Matter to many Minerals ; because it changes its Situation, for better or worse, as soon as it meets with other Matter ; with which it constitutes a new Genus, quite different in Nature from either. For this Reason Providence has dispersed the Brine every where thro' the Bowels of the Earth, to answer these several Ends. For Brine strikes

the deepest of any Minerals : Hence it is found in the lowest Places, where they dig and bore for it. Nevertheless, its Current passes thro' the mountainous Rocks, in well secured Channels ; out of which this bituminous or mineral Balsam exhales, to fertilize the several Fossils, for our Benefit. This is not a mere speculative Hypothesis, but a real Fact gathered from the Art of Mining, and discovered in the Bowels of the Earth.

Coal is seldom very near the salt Brine ; but at a small Distance from it, in what we call the *mineral Zonic*. What we mean by a *mineral Zonic*, is a District where all the Glebes, Stratum, and Hills are regularly interwoven with each other ; that these Vapours, from Brine, or mineral Ferments, may ventilate, and circulate thro' the whole. Wherever this is cut off by Mountains, that take another Course, and the Glebe lies different, and in Opposition to the other, there one mineral Zonic ends, and another begins.

When the Minerals have any Dependence upon the Brine, we judge by the different Kind of the Rocks, Stones, Glebe, Soil, Water, and the Things appertaining thereto ; nor do we pass over Vegetables slightly. For Instance, to look for Coal in any given Zonic,

we

we begin with the Top, or Surface-earth ; and, by diligently searching, we shall meet at least with some Vestiges of it, provided it be there ; which will direct, and guide us to Stratum more particularly suited to it : And this, probably, will give us such Indications, as will conduct us to the very Coal. Thus, by following Nature, we may easily arrive at the subterreanean Storehouses, and supply our Wants. For Nature is every where the same. Providence has universally dispensed its Bounty ; if we did but know, how to discharge our Office prudently, diligently, and virtuously.

There are some *French* Naturalists, who conjecture, that Pit or Fossil Coal is generated from Wood, which was buried in the Entrails of the Earth at the general Deluge ; and that the Wood first became embalmed with marine Salt ; and afterwards impregnated and fertilized by the Vapours of Brine. There is not the least Doubt, but the Brine extends itself far amongst the Rocks ; but that Coal has been first Wood is only a Conjecture. This will plainer appear, if we consider that Coal, most commonly, has an Iron-stone near it ; that when the Coal is work'd out, and the Pillars taken away, the Free-stone will close the Vacuities ;

cuities ; and that the Iron-stone that is left will be, within the Age and Memory of a Man, turned into good Coal again. Besides, a mellow Iron Ore may, by artificial sulphureous Vapours, be changed into Coal: For the Matter, that causes the *Phlogiston* in the Sulphur, is the very same unctious Bitumen we meet with in the Brine.

Notwithstanding we owe a great deal to this bituminous unctious Matter, yet we cannot have our Sulphur-water without the Pyrites, Mondic, or Marcasites: And here again the Coal naturally comes in. But we must not mistake the Matter, (the Bitumen or Coal Sulphur) as is often done: For we mean, that every particular Thing in its Substance is required as an Ingredient to generate this new Compound. Let us examine Coal; and we shall soon find, that, besides the sulphureous unctious Matter, it contains the vitriolic Acid, and Salt. All which, upon Analization, appear to be requisite Ingredients to constitute its Essence. Hence it is, that commonly sulphureous Marcasites are found amongst Coal. We ought therefore to study their Difference: For that there are many Kinds of them every Body knows. But to be acquainted from whence this Difference proceeds, is of public Utility:

Utility : Because that Knowledge would enable us to judge of untried Ground, whether it be proper to produce that Mineral or not.

What I have here said of Coal will hold equally good with regard to Metals, Minerals, and other Fossils. For, from what I can gather from the great Book of Nature, I cannot persuade myself, but that the unctious Matter of the Brine distils itself thro' all the Bowels of the Earth ; and fecundates the Metals and Minerals it meets with, and accordingly changes their original Quality and Texture. For Instance, in Quicksilver Mines, there are pernicious mineral Damps, which infect the Miners, in a manner that gives them uncommon Pains in the Limbs, and Bones ; and, in dissecting their dead Bodies, all their Sinews, Nerves, Blood-vessels, and Membranes, are found pervaded and work'd thro' in innumerable small Holes. Now if the Damp which causes this Malady be collected, and chemically examined, we shall find its first Origin to be Brine ; and as the pernicious Quality lies in the Quicksilver, we therefore conclude, that the Brine-vapours attracted and carried it thither.

The Sea-water, when it stagnates and putrifies, produces arsenical Particles. And thus,

ad Infinitum, a Change from one Thing into another is brought about, just as the Meteors happen to mix with this or that. From which Chain of Changes we may easily conclude, that they are the Causes of the many Minerals and Fossils ; if Metals themselves are not benefited thereby.

The Smell in this Sulphur, or stinking Water (as it is called) is, of any Thing it can be compared to, the most like to that which accompanies the washing of a Gun, after it has been often fired. This is also a certain Indication of both Coal and Brine : For that Smell can never be produced, but when Alkalies, and a strong coarse sulphureous Vapour are both joined with the mineral Ferment. Now from whence can we expect a sufficient Alkaly in the Bowels of the Earth ; unless it be the alkaline Earth of Brine ? For the rest of the Minerals are destitute of Alkalies. And from what other Fossil can we so naturally suspect a coarse sulphureous Effluvium, as from Coal ?

Experience then teaches us, that these stinking Sulphur-waters have their Existence from the Vapours of a mineral Ferment ; to which the Coal-damps and the Brine-alkaly are joined ;

joined ; and that without these last no stinking sulphureous Waters can naturally be expected.

If it be here asked, By what Authority we can warrant these Assertions, since (as is commonly objected) we cannot look into the Heart of the Earth ? We shall, by Way of *Reply*, ask, on the other hand, What would Chemistry be, could we draw no right Conclusion from Experiments and Processes ? Why should we be deem'd to wander in more Uncertainty, than the Astronomer ; whose Region is so many Millions of Miles more distant from him, than the Matter which we handle and comprehend with all our Senses ? Yet some of the Astronomer's Calculations can justly boast Exactness in Time, even to a Minute ; and from thence most of his Conclusions are taken for granted. Surely, then, we have greater Advantages. We work in the Mines themselves ; in them we observe Nature in Perfection. What is dug out we examine, by reducing it into its component Parts. By these Means we often arrive at the Knowledge of the Effects the several Substances can naturally produce : And when we find these Effects in the respective Offsprings ; may we not, without the Imputation of Vanity, venture to

declare, that we are not unacquainted with the true and proper Parents?

Before we descend to the Particulars of the *Llandrindod* Sulphur-water, we cannot omit taking Notice of a Circumstance, which may, sometime or other, prove of the utmost Consequence to the public Utility, *viz.* the Property of killing Worms.

We are entertained by several Travellers with an Account of a Water, that kills Caterpillars, and Locusts, when sprinkled on the Herbage, or Vegetables, on which this Vermin feeds: Which Water is also a Remedy in many Diseases. The candid Mr. *Baumgartner* gives us the most natural Account of it, in the following Words.

“ There came to the Place, where we were,
“ two Men of *Cyprus*, with a wonderful Wa-
“ ter, that they had been sent out of *Cyprus*
“ into *Persia* to fetch. Of this same Water
“ they told very strange Stories; particularly,
“ that if any of it happened to drop upon the
“ Ground, or any Vessel it was in, it no sooner
“ touched the Ground, but it vanished im-
“ mediately out of Sight: That, for this Rea-
“ son, they were obliged always to have it
“ fixed on a forked Stick. That it was of
“ great

“ great Use against the Caterpillars that de-
 “ stroy the Corn ; for in whatever Place or
 “ Country they kept some of this Water, Ca-
 “ terpillars could no longer live there. That
 “ formerly *Cyprus* had been much infested
 “ with this Sort of Vermin : But that the
 “ Inhabitants having got some of this Water,
 “ and hung it up in one of their Temples,
 “ the whole Island was, by that Means, freed
 “ from them. They told us moreover, that
 “ they had been sent for this Water by the
 “ Governor of *Cyprus* ; and that they had
 “ been above ten Months in their Journey.
 “ That when they first set out, there were
 “ four of them ; but that the other two were
 “ almost starved to Death with the Cold ; and
 “ were not able to come up with them. What
 “ was related to us here, we found to be ac-
 “ tually true, when we came to *Cyprus* ; as
 “ that it was not only sprinkled in their Fields
 “ against their Caterpillars ; but it was com-
 “ monly drank, as a Remedy or Medicine
 “ against most Distempers ; and that it was
 “ effectual to that Purpose *.” The more I
 reflect on this Passage, the more I am con-
 firm’d in my Opinion, that this Wonder from

* *Churchill's* Collection of Travels, Vol. I. p. 486.

Persia is nothing else but a Sulphur-water of the same Kind we are here treating of. For of this I am certain, that this Water will destroy all Vermin, if but slightly sprinkled over the Herbage : Nor will it do any Damage to the Growth of the Vegetables. Therefore, as a small Quantity of it will preserve a great deal of Herbage, might it not, if our Gardeners and Herbalists had it ready at Hand, answer their Purpose, by preserving the Vegetables in a favourite Garden from this devouring Vermin ? This might point out a farther Improvement, and make its Use much more extensive. For should Heaven punish us with Locusts, perhaps this might, in some Measure, prevent the fatal Consequence of their devouring Rage : For, I apprehend, the Author means Locusts, when he mentions Caterpillars.

These Men took great Care to preserve the Virtue of the Water in the Carriage. Our Water requires a not less diligent and skilful Management ; especially in a hot Season of the Year. By Exportation (if rightly ordered) its Smell or Stench increases ; and it becomes more beneficial, and effectual in destroying Vermin.

There

There would be a great deal of Reason in this Conjecture, were we even debarred of all Experience and ocular Proof : But this makes the Thing far more probable. For, at certain Seasons, and in particular Winds, the Stench of these Waters is perceptible at a prodigious Distance from the Wells ; and within that Limit no Vermin dare approach the Herbage. This Scent is also improved by keeping the Water in a close Vessel. But the volatile Sulphur-waters (of which we are not treating here) that lose their Smell, when taken out of the Spring, are not fit for this Purpose.

Let us now, without any farther Digression, proceed to the Particulars of the *Llandrindod* Waters. There is not one, but several Sulphur-waters, in the mineral Zonic of *Llandrindod* ; but, as they are all of the same Nature, we made our Experiments on that only, which is contiguous to the saline Pump-water ; that being chiefly used : It is in a pleasant Grove, about a hundred Yards North from the Pump. There are two Springs of it ; one of which is used for Washing, and the other for Drinking.

These Springs were discovered, about twenty Years ago, by Mrs. *Jenkins*, the Tenant's Wife, in the following Manner. A Daughter of
hers,

hers, had been afflicted, about five Years with an ulcerated Head, brought on by a Fever. The Mother, seeing that the neighbouring Sulphur-waters cured similar Cases, caused a Search to be made for one near Home: Her endeavours were requited with the Discovery; and the Discovery with the Success she expected: For she not only cured her own Child, but did a great deal of Good to others; as indeed to all she has ever since recommended it to.

The Spring of this Water strikes from the North, and runs towards the South; so that it is diametrically opposite in its Current to that of the saline Pump-water. It has its own Hill; which rises to the North, and is separated by a Brook, from that to the South, which yields the saline Pump-water. The Hill, out of which this stinking Spaw issues, is composed of Stone of several Kinds; as a hard Slate; a Grit; a Kind of a Freestone, and Horn-stone, intermix'd with the Spar; and meagre sulphureous Pyrites lying, as if irregularly or promiscuously thrown amongst each other: And beyond this Rock, at the Distance of about two or three measured Miles, I believe (and that not without Reason) that there is an excellent Bed of Coal.

In

In this Rock I conjecture, from apparent Indications, that there is a confused Mass of Minerals ; which like a Bar cuts off the Bed of Coal that is farther to the North. This confused Mass we suppose to be, as it were, in a constant Ferment. With it not only the bituminous Matter of the Brine, but also the briny alkaline Earth itself mixes : Which, being joined by the Coal-damps, constitutes *the sinking, or the Sulphur-water*.

In this supposed Ferment, we may conclude the Mondic, or sulphureous Marcasites, to be one of the principal and chief Agents ; because there is very little in the Bowels of the Earth, but Mondic or sulphureous Marcasites, that can produce it.

A pure Sulphur also enters the Composition of this Water ; which precipitates itself into the black Sediment ; and out of the white Mucus, that lines the Sides, a perfect Sulphur may be separated. Not that I believe, that a perfect Sulphur Mineral, or such a one as only contains what is called native Sulphur, is the productive Cause of this Water ; but rather, that it is the Offspring of the Mondic or the Marcasite. For was there any perfect Sulphur in the Mixture, it would have stopped the Ferment, whose Acid Principle would have dissolved

dissolved the Iron Earth (which no mineral Veins or Beds are without) and, instead of a *stinking*, it would have produced a *chalybeate* Water.

There is another Thing in this natural Precipitate, which will dissolve in Spirit of Wine. When this black Precipitate is made dry, and put into a Glass, and set to infuse with Spirit of Wine, in warm Sand; the Spirit will extract a fine orange-coloured Tincture out of it; which, upon Examination, is found to be neither Sulphur, nor Succinum, or any other mineral Bitumen; but a Sort of Crocus of many Minerals: Hence we conclude it to be the Effect of what we here call the mineral Ferment.

Van Helmont, in his Treatise on Spaw-water, talks a great deal of inseparable Sulphur; and again, he calls the Vapours a native Mercury *.

As there is nothing in the medical mineral Waters, but what can be separated; and as we cannot find any Traces of native Mercury; and as we cannot comprehend how that unctious Mineral or metalline Body could mix in any Shape with Water; he must be judged

* *Van Helmont*. *Physic. refined*, Page 71.

to speak from Speculation only. A pure Sulphur may be extracted out of this Kind of Waters: What need have we to suppose an inseparable one?

We do not deny, but that there is Iron Earth, in this confused Mass of Minerals, which constitutes the Sulphur-water; because the Mondic or sulphureous Pyrites are never without it: But the common Opinion, that it contains chalybeate Contents, is erroneous. The strictest Examination cannot manifest the least irony or chalybeate Principle; nor is it naturally possible, that it should; because the mineral Ferment produces an unctious Matter, which goes into the Composition of our Sulphur-water. Now this unctious Matter is of such a Nature, that it will not mix with chalybeate Contents: On the contrary we may, at any Time, precipitate the iron Earth out of chalybeate Water with this very unctious Matter. Hence it is plain, that we cannot expect such an Agreement, as would effect an homogeneous Mixture betwixt these two Bodies. This unctious Matter is certainly of great Consequence in the mineral Region; tho' it is the Offspring of innumerable Fossils. Experience has informed us, that to this the metalline Splendor is chiefly (if not wholly) owing

owing. Without this phlogistic Principle Metals would be imperfect: So that the Alchemists are certainly in the right in what they assert on this Head.

It is therefore greatly to be lamented, that this unctious Matter, which is plentifully dispersed thro' *Wales*, is not used to improve the Art of Smelting. From this most Metals under Ground contract the *Principium Inflammabile*; but the Iron Earth, or Iron Ore, does not: Which is another Reason, why we cannot suspect chalybeate Principles in this our Sulphur-water.

I do not deny, but that, amongst the immense Variety of Nature's Productions, Sulphur-chalybeate Waters are frequently found. I allow Chalybeates are not without a Share of Sulphur. But this Combination, this Union of the unctious Matter with the chalybeate Contents, is owing to a *Tertium quid*, another Ingredient, not to be met with among the Class of Waters I am here treating of.

We have often here made Mention of a mineral Ferment; which Word, however, we do not make use of in the strict Sense, that Fermentation is generally understood in. I grant there are but three Kinds of Fermentation, the spirituous, acidulous, and putrid.

But

But what I here mean by the Term Ferment, is an intestine Commotion of several Minerals, caused by a Dissimilitude of their component Parts. From this intestine Motion the untious Matter, we are here speaking of, results: Which as it so much resembles Fermentation; we have ventur'd to apply to it the Name of Ferment; and hope we shall not be censured for the Application.

This inward Motion will exist amongst these several Minerals, even when they are separated from their Roots, or dug out of their Matrix. For Example, in many mineral Countries the Marcasites, of all Kinds, being promiscuously thrown in one Heap together (tho' above Ground) such an inward Motion will be excited, that sometimes it will break out into a Flame: By which Means, an Alum, and Vitriolis produced; which being all extracted, and the remaining Rubbish thrown into a Heap again, a new Motion or Ferment arises; which, as before, produces Alum and Vitriol; and so *ad Infinitum*.

The Coal Damps, which we have mentioned, as one of the Causes of this Sulphur-water, and to which we attribute the Quality of destroying Vermin, may perhaps convey alarming Ideas to our Readers, and give them

Occasion to suspect it to be of a coarse rough Nature ; but we can assure them of the contrary.

It is perfectly mild, and agreeable to the human Constitution : For what is Poison to one Animal, is a Medicine to another. For Example, a Dog lives upon the same Food as the human Species ; yet as much *Crocus Metallorum* as will poison ten Men, will perfectly agree with a Dog : And again, one Man may safely take as much *Nux Vomica*, as will kill several Dogs.

As to the Coal Damps ; they are no more than sulphureous. They are destitute of arsenical, or other noxious Contents ; with which other Minerals are so much loaded : So that they are by no Means detrimental to Health ; as Experience confirms. For Smiths, and other Artificers, that are constantly in the Fumes of Coal, have an uncommon Share of Health. And where is there, in all the World, a more healthy Place, than that opulent, but smoaky Metropolis *London* ; where, notwithstanding the uncommon Multitude of People, but few Physicians have Practice enough to support themselves in any tolerable Dignity.

Before

Before I conclude this Chapter, I cannot help observing, that I look upon this Sulphur more beneficial, and far preferable, to cleanse and purify a Ship, and its Crew, that come from Places infected with the Plague, than the Fumigation with Brimstone (of which lately an ingenious Method is published by Dr. Hales) and at the same Time the Operation would be more easily and conveniently performed, than by the troublesome Method, that is laid down, with Fumigation.

C H A P. II.

Contains the Experiments from which the Contents of the Llandrindod Sulphur-water are ascertained; and an Enumeration of the Distempers, in which it is likely to prove salutary.

THE Experiments were made on the Water in the Presence of several Gentlemen, at the Head of the Fountain, on the 30th of August, 1754; when the Weather was extremely clear, dry, and serene; and the Wind blew from the East. In such a Season, the Water may be supposed to be in its

utmost Perfection ; and these Occurrences tend to facilitate the Experiments.

1. It springs up, as clear as Crystal, at the Foot of a rising Hill. It is soft in its Nature ; and more unctious than hard. It weighs about 23 Grains lighter, in a Pint, than common Water : And mixes agreeably with all Kinds of Liquors, except the various fermented ones.

2. The Smell is sulphureous, exactly resembling that, which is perceptible in making the *Sulphur Auratum Antimonii*, with which Chemists are well acquainted. To the Taste it seems soft, and is agreeable to the Stomach. The Sides of the Bason are lin'd with a white hairy Mucus ; yet the Precipitate is black ; for when the Water stands and stagnates, it contracts a black Cuticle.

3. All the black Precipitate is perfectly unctious. When thrown upon hot Coals or Iron, it will emit a blue Flame ; and smell like Brimstone. And out of it a perfect Sulphur may be separated. If this Precipitate be gently dried, an Orange-coloured Tincture may be extracted out of it with Spirit of Wine ; which, on Precipitation and Edulcoration, proves to be a subtle fine Crocus, which the Magnet will not attract.

4. If

4. If this Water, at the Spring-head, be put into a Bottle, and well secured, the Strength will remain; and even increase: But if the Bottle be left open, and exposed to the Air, the Smell almost entirely vanishes, in about 30 Hours Time.

5. At the Fountain-head, this Water causes a great Heat with Oil of Vitriol.

6. Spirit of Vitriol, and all other Kinds of acid Spirits, make no Alteration at the Fountain-head: But, on standing, the elastic Spirits most plentifully appear; and shew themselves by lining the Inside of the Glass with Clusters of Globules.

7. With Spirit of Salt Ammoniac there ensues no Change: This acts upon it in the same manner, as was related of the Acids, in the foregoing Experiment.

8. *Oleum Tartari per Deliquium*, struck first a light Pearl, and in a few Minutes afterwards a fine Agate yellow Colour. The next Day a Precipitate of a dark dirty yellow Colour was let fall, the Water remaining clear under a whitish blue Cuticle, which was on its Surface.

9. *Sal Absynthii* gave a Milk-white; which next Day was changed into a yellow Precipitate:

tate: The Water above the Precipitate appeared replete with small elastic Globules.

10. With Spirit of Hartshorn it yielded a yellow White; and the day following a beautiful purple Precipitate.

11. With Spirit of *Sal Volatile* there appeared a Milk-white Colour; the Day following a white Precipitate, with elastic Globules lining the Inside of the Glafs.

12. With crude *Sal Ammoniacum* no Alteration.

13. With *Sacchar. Saturn.* a whitish grey Colour; which next Day was changed into a dirty brown Precipitate, the Water remaining clear above it.

14. With Galls no Alteration immediately ensued: However, the Day following they had given a fine light bright Yellow. The Galls at the Bottom, without any other Contents, were changed into a dark Colour.

15. Silver Leaves were changed, in less than six Minutes, into a fine yellow Gold Colour; which was not altered the succeeding Day.

16. Cochineal gave a purple Colour; the next Day a black Precipitate; above which the Water appeared of a dirty red Colour.

17. Red

17. Red Saunders afforded a dirty Red : Next Day they were precipitated in their own natural red Colour ; but left a yellow Tincture in the Water above the Precipitate.

18. The Salt being extracted out of this Water, after the usual manner, it was found, that each Quart contains about 26 Grains.

19. This Salt being analyzed, it was found, that the saline Earth, which gives the Texture to this Salt, is chiefly the alkaline Earth of Brine.

20. The Salt of this Water easily fluxes without any Crackling. It shoots into small regular Crystals : And is of a soft oleaginous Nature.

21. With a caustic Alkaly this Water may be work'd, so as to unite therewith ; and, when so united, the Liquor is somewhat saponaceous ; as if Fat or Oil had been mixed together with Water.

22. In evaporating this Water there appears a balsamic Matter ; which emits a Scent like Balsam of *Peru*.

23. If this Water be distilled in a Retort, this balsamic Matter may be obtained, almost in the same manner as essential Oils are ; it participating much of the Nature of essential Oil.

24. The Acid in this Salt is perfectly entangled, and guarded by this unctious, balsamic Matter.

25. This unctious Matter appears to be a mineral Oil, of the first Class, and much inclin'd to Amber in its Nature.

These are the Experiments which we think sufficient to relate ; as from these we are able to conclude, with Certainty, what its Contents are.

1. The Water is a soft saponaceous chrySTALLINE clear Liquor. It is considerably lighter than common Water. Out of it subsides or precipitates a black unctious Matter ; which, amongst other Things, contains Sulphur, as is evident from the Scent it emits : So that it is very properly called *Sulphur-water* ; because that Principle is obvious to all our Senses. This farther appears, and stands confirmed by Experiments 2, 3, and 21.

2. That the Marcasites or Pyrites have undoubtedly a Share in the Production of this Water, is evident from the Crocus, that is produced by Experiment 3 ; and also from the Effects the Air has upon it in the 4th Experiment ; which are similar in all Liquors obtained from the Pyrites. To the Pyrites we may also attribute the Effects of the
5th

5th Experiment, for their very Nature is to tepify Waters, whenever there is an inward Motion excited (which we have called the mineral Ferment) provided there are no Salts or other Admixtures present, to prevent the ensuing Heat: Which is the Case here; or else we should have this Sulphur-water spring up tepid, and hot as the Bath-waters. The resisting Ingredients are, in the Experiment, overpowered by the Admixture of the Oil of Vitriol; which, I allow, makes all Waters hot; but, as it renders this uncommonly so, we may justly conclude it owing to the Pyrites.

3. That these Waters spring up cold is no bad Property: For were they made hot in the Bowels of the Earth, we should, in a great measure, if not entirely, lose the ætherial volatile Spirits; which in this, as well as other mineral Baths, are of the utmost Consequence.

4. That the Acid is also the Solvent of the mineral Contents, is manifest by the sixth Experiment; or else the Spirit of Vitriol would have caused a Precipitation, or a Sediment: And that these mineral Contents are not related to the Iron Tribe, is evident from
the

the 3d Experiment ; because the Crocus, extracted with Spirit of Wine, will no ways obey the Magnet, nor by any other Means discover any Iron-principles. But that this Water, in some measure, is of a neutral Quality, is plain from the 4th Experiment ; because the Spirit of Salt Ammoniac causes no Sediment, or any other Alteration ; as might have been expected from it, was the Spirit of Salt Ammoniac an entire Alkaly. This neutral Quality in the Water, we attribute to the unctious mineral Matter, that is contained in it, called by the Alchymist the *Life* and *Soul* of all Metals ; and Experience has constantly confirmed another alchymical Assertion, *viz.* that it also is the most salutary Medicine for Animals.

5. When there comes a thorough Alkaly to be mixed with this Water, that is Caustic enough to subdue and dissolve this mineral unctious Matter, a Precipitate or Sediment ensues, as appears by Experiments 8, 9, 10, 11. Hence, again, it is evident, that the Acid is the Dissolver of its mineral Contents. Nor are the ætherial mineral Spirits less perceptible from the Admixture of Alkalies, than of the Acids ; which is a most convincing Circum-

Circumstance of the Plenty of their Existence. Hence it is manifest, of what superior Efficacy these cold Sulphur-waters are to the *Thermæ*: Which latter naturally are no more than Sulphur-water; but have lost these excellent Spirits by becoming tepid. If any Warmth is required, how easily is it to be acquired with these Sulphur-waters, to any Degree we want it?

That Salt Ammoniac, as is mentioned in the 12th Experiment, has no Effect upon the Water, is (as we have already observed) owing to the mineral Oil, or Fat it contains.

6. One Metal precipitates another after Solution: Of which we have an Instance in Copper and Iron. And some will precipitate Semi-metals, and even Marcasites; which are all we can expect to find in our present Subject. Lead is of this Kind. It affords a Precipitate for many; as it does here in the 13th Experiment. But that there are no Traces of Iron (by some called Steel) in this Water, is proved beyond Dispute in the 14th Experiment. For the dark Colour of the Galls was caused by the natural Precipitate of the greasy Matter of the Water; and would have been Jet-black, had there been a sufficient Quantity of Element: But had there been

been any Iron, we should have had a purple, and a blue Colour.

7. That the Sulphur is perfectly dissolved in this Mater, and exists in its utmost Purity, or without any other Admixture, and is diffused through all its Parts, is plainly proved in the 15th Experiment, by the Continuation of the Tinge given to the Silver. So that a mature Concoction, in the Bowels of the Earth, and an intimate Mixture, and Combination of all its Contents with this Water, cannot be questioned.

8. The Non-existence of ferruginous Contents is proved again in the 16th Experiment, For as the supposed Transmutation of Iron into Copper, in certain Mines in *Hungary*, by the Water that comes out of them, has been, these thirty Years past, by Dr. *Stabl* and *Newman*, proved to be no more than a Precipitation of one Metal by another; I was surprized to find, on *May* 17, 1753, the following Article in one of the public Papers, as from thence. It was enough, almost to make one suppose, that learned and illustrious Body, the Royal Society, had been unacquainted with the true natural Cause; and by what Means we obtain the Copper which Nature gives us
in

in a liquid State in Mines. The Paragraph was as follows :

“ Last *Thursday* a philosophical Account,
 “ communicated by Dr. *Bond*, was read be-
 “ fore the Royal Society, of a remarkable
 “ Spring, issuing from a Copper Mine, in the
 “ County of *Wicklow*, in *Ireland*; into which
 “ thick Iron Bars being put, in three or four
 “ Months are entirely consumed, and a Quan-
 “ tity of Copper greater than that of Iron is
 “ found, generally in the Form of coarse Sand,
 “ at the Bottom of the Pits in which the Iron
 “ Bars lay. This Effect has been commonly
 “ mistaken for a real Transmutation of the
 “ Iron into Copper: But the Doctor, by a
 “ chemical Analysis of the Water, found,
 “ that the Copper is dissolved by a strong
 “ mineral Acid, and mixed with the Water
 “ passing through the Copper Ore, in the Mine.
 “ By which Means the Copper remains sus-
 “ pended in the Water, till it meets with the
 “ Iron Bars in the Pits, contrived for that
 “ Purpose; where, the Acid being more
 “ strongly attracted by the Iron, than by the
 “ Copper, the latter necessarily falls to the Bot-
 “ tom, or is precipitated; while the former
 “ is gradually corroded, or dissolved by the
 “ same

“ same Acid, and carried off in the Stream
“ constantly flowing from the Spring. As
“ this Account is supported by just Experi-
“ ments, it appears to be a sufficient Solution
“ of that Phenomenon, which has so long
“ surpris’d the Curious.” Was there any Iron
in it, the Tincture given by the Cochineal
would have more or less inclined to Blue, ac-
cording as it had met with more or less Iron ;
witness the making the *Prussian* Indico ; where
it manifestly changes into that Colour. As
to the red Saunders in the 17th Experiment,
it informs us of nothing ; because the Water
acted, on this Dye-wood, no more than what
common Water would have done : Nor could
it be well expected, that its Salt and Acid
should enter into this woody Substance, when
we consider how they are enveloped in the
mucilaginous or unctuous Matter.

9. This Water does not abound too much
with Salt. There is no more in it, than is
barely sufficient to keep the Body open : So
that we need not fear that a Diarrhœa will be
brought on by its Use, even in consumptive
or emaciated Habits. For, according to the
18th Experiment, no more than 16 Grains
are contained in a Pint. Although it appears,
in

in the 19th Experiment, that the Salt of this Water owes its Tincture to the Brine-alkaly; yet the greasy unctious Water keeps this alkaline Earth, as well as the Acid, so sheathed, that it can be no way detrimental to the Constitution. This evidently appears in the 20th Experiment; where, in the Fire, the Alkaly cannot shew its Nature, being so overpowered by the mineral Oil.

10. In consumptive, and many other chronic Cases, a particular Softness or saponaceous Quality is required in the Remedies, that are made use of; in order to lubricate the Vessels, and soften the impacted Matter. The Existence of this Quality is manifested in Experiment 21.

11. By Experiment 22, the greasy unctious Matter plentifully appears. Which also, according to the 23d Experiment, may be obtained in another manner. This not only corroborates the foregoing; but also evidences what already has been observed of the peculiar Lightness of this balsamic mineral Oil; which, like a vegetable essential Oil, will rise in Distillation. The 24th Experiment informs us, that the Acid is perfectly entangled in this Oil. And the Oil itself is of the first
 Class

Class we meet with in the mineral Kingdom; according to the 25th and last Experiment.

12. It has been an Opinion first started by Dr. *Lister*, that these Waters acquire their fetid Scent and Taste by Stagnation. The contrary of this is sufficiently demonstrated by Dr. *Short*; so that it is needless to say here much about it: But, as I am often question'd on this Head, I shall just observe here;

1. Was it a stagnated Water, the Spring and current would cease.
2. All our Experiments argue the contrary. In these we meet with quite other Contents, than can be expected in stagnated Water.
3. But above all, Dr. *Short* has the most just and convincing Argument to decide this Matter; when he says, that Water corrupted by Stagnation only, will not put a Stop to Fermentation; which Quality is peculiar to a perfect Sulphur-water: Much more might be said against this Error; but let this suffice.

Upon the whole then we may venture to conclude, that this fetid or stinking Sulphur-water (as it is called) contains,

1. Ætherial volatile mineral Spirits.
2. A small Quantity of vitriolic Acid.
3. A mineral unctious Mucus.

4. A fine mineral Oil.
5. A subtile Crocus of Marcasites, soluble in Spirit of Wine.
6. A perfect Sulphur.
7. A neutral Salt ; whose Texture is a briny Alkaly.
8. The Element Water.

Now let us dismiss the Experiments ; and consider in what Disorders this Water is salutary. In all such Distempers where Bathing is requisite or serviceable, this Water, prepared into a tepid Bath, is equal if not preferable to any natural or artificial warm Bath now in being. Dr. *Hoffman*, who has written most accurately on the Nature of warm Bathing, has given several Methods to prepare, and imitate hot Baths. I am persuaded, had he been acquainted with a Sulphur-water, of the same Kind we are here treating of, he would have preferred it to pure simple Water. Because this, 1. is lighter than common Element : 2. It is perfectly soft and lubricating : 3. It not only makes tender what is boiled in it ; but also perfectly dissolves Flesh and Pulse, when digested with it : 4. It has a natural unctious Mucus, far preferable to any Dr. *Hoffman* recommends to add to his artificial

T

Baths :

Baths: And 5. the ætherial mineral Spirits, which may be greatly preserved in preparing the Bath, give a superior Advantage; and totally tend to render the Water subtile, soft, and thin; so as to make it more easily enter the solid Parts of the Body.

Bathing is not a new Remedy. It was very well known in the most early Times. But Misapplication had brought it into Disuse. Nevertheless, it is a powerful Remedy; such a one as will not bear trifling with, but requires to be used with the strictest Caution. Nor need we wonder at it, if we do but duly consider the Effects it has upon the human Body, *viz.* It attacks the Juices in their inmost Recesses; and disposes them to a Solution and Suppuration of what is noxious. It lays a great Stress on the Solids; and the whole Constitution is excited, and as it were summoned, to surrender its supernatural Incumbrances: But as it exerts its Influence upon the Fluids, as well as Solids, at the same Time; great Caution ought to be taken in its Application. Dr. *Hoffman* has given the most rational, as well as the most plain mechanic Account I have seen on this Subject: Of which (as it is written in a concise manner; and as

“ I can

I can add nothing better) I will here, for the Benefit of my Readers, insert the Sum.

In Page 173 he goes on thus. “ We come
 “ next to explain the general manner wherein
 “ warm Bathing acts. And first, when the
 “ Body is plunged in a pure light and simple
 “ warm Water, the Heat necessarily rarifies
 “ and expands the Blood, and all the Juices;
 “ and thus dilates the whole System of the
 “ Vessels. For it is the Nature and Property
 “ of all Heat, by the means of an extremely
 “ subtile, ætherial Matter, to insinuate itself
 “ into Fluids, and increase their internal Mo-
 “ tion, enlarge their Bulk, or cause them to
 “ expand and rarify; as manifestly appears
 “ in the Thermometer. Upon this Dilata-
 “ tion of the Blood, the Pulse or contractive
 “ Strokes of the Arteries increase; whence
 “ the Blood circulates with greater Force;
 “ and the external Parts of the Body become
 “ red, and begin to sweat.

“ The Body suffers another Change from
 “ the Gravity or Pressure of the Water. This
 “ Pressure is known, from Geometry and
 “ Mechanics, to be eight hundred Times
 “ greater than that of the Air: Whence’tis no
 “ Wonder, if the Body plunged in the

“ Water be greatly altered ; as its Surface, in
“ that Case, sustains a violent Pressure ; which
“ squeezes the Blood forcibly inwards upon
“ the Viscera. Thus whilst the Vessels are
“ compressed from without, and dilated from
“ within, the intestine Motion of the consti-
“ tuent Parts of the Blood is increased ; and
“ consequently the viscid Juices are thus dis-
“ solved ; obstructions overcome ; and the
“ Humours better fitted to pass through all
“ the secretory and excretory Ducts. And
“ as, by the Water’s Gravity, the Parts are
“ compressed from without, and the Blood
“ driven copiously into the Heart, Lungs,
“ Brain and larger Vessels ; hence, if the Bath
“ be too hot, it causes Palpitations of the
“ Heart, Oppression in the Viscera, or some-
“ times Fainting : And again, when the Body
“ is foul, or full of bad Juices, it produces
“ continued Fevers ; or inveterate Intermit-
“ tents, if the first Passages abound with Cru-
“ dities. These ill Effects are frequently ob-
“ served in those hot Springs, which have also
“ an astringent Quality ; as the violently hot
“ *Caroline* Spring evidently has : Insomuch
“ that by Bathing herein, whilst the Water
“ continues overheated, it produces Fevers of
“ all

“ all Kinds, and frequently such as are dangerous.”

The good Effects these Baths produce are answerable to the great Caution required. For not only the greasy unctious Matter, which clogs, and obstructs the small capillary Vessels, is dissolved; but the indurated Skin is softened; what was before callous is mollified, and render'd pervious; and the stagnant Juices are put in Motion again. Hence it is, that always an unctious Matter is found floating in the Water after warm Bathing. Of this Kind *Hoffman* records two Instances*; where it might have been skimmed off with a Spoon. The one was the Case of an Hypochondriac Patient; and the other was a Woman afflicted with Pains in her Loins. Because, when its Texture is loosened, and the Pores and Vessels opened, the Blood and Juices have a more free Passage to the Surface, to dislodge this greasy Matter.

Now we shall particularize the Distempers in which Bathing is salutary: But the *Rationale*, or manner how it acts, in eradicating each Distemper, I shall omit; because this has been handled so well by Dr. *Hoffman*, that

* *Hoffman*, Pag. 179.

I would not pretend either to amend or improve it. We therefore refer our Readers to him *.

To some perhaps it may seem strange, that warm Bathing can be serviceable in internal Disorders: Yet it is most certain, and confirmed by a well-grounded Experience; because it gives the Blood a freer Circulation; and assists the Office of Perspiration; so that a great Part of the Impurities pass through the relaxed Strainers. Besides, the Benefit of the internal Use of the mineral Waters is greatly facilitated by Bathing.

Bathing is likewise salutary in paralytic Disorders. In benumbed Limbs, caused by an Apoplexy. In such Habits where the Limbs are dried or wasted, and the circulatory Vessels require to be distended.

In the hypochondriac Malady; where the Blood is too much accumulated, in certain Vessels; where it thickens, stagnates, and causes Obstructions in most of the secretory Organs.

In venereal Disorders, where the Symptoms have abated for a Season, and an innumerable Train of malignant Evils revive, mak-

* *Hoffman*, Pag. 168 to 187.

ing a strong Constitution wretched for Life, if warm Bathing in this Water is added to the usual Remedies, a perfect State of Health may be expected.

Also in old Sores, Tetters, Leprosy and Scurvy : In the Hydrophobia, or the Bite of a mad Dog ; Madness, and Diseases in the Head. In the Stone and Gravel. In the Rheumatism, and gouty Disorders : And in many others, which we must leave to the Direction of the Physician to advise it for, agreeably to the Constitution of the Patient.

How serviceable soever the external Use of this Sulphur-water may be, it is no less beneficial in the internal Parts. It there not only exerts its Influence immediately on the Stomach and Bowels ; but mixes with the Juices ; and extends its Effects to the most remote Passages ; and, in many Respects, acts as absorbent Liquors do in the Chemists Vessels, when mixed with their Opposites.

The Scrophula, or King's Evil, is often hereditary, often contracted. It is a Disorder, that must yield its Venom to the Power of this Water : But both the internal and external Use are indispensably required. Many of these Patients have been cured with the *Llandrindod* Sulphur-water : Nor is this very surprising ;

because it is no more but what has been related of other Sulphur-waters. And many more Cures of this Kind might be performed with the Assistance of chemical Medicines.

The Use of such a Mucus, as this Water produces, in outward Applications, was practised in the most early Ages. *Galen* gives an Account of a slimy Matter near the River *Nile*, which was famous for this Purpose. The *Bath* Clay likewise was formerly in very great Repute. Surely then the slimy Matter, that is the Produce of an Agitation of the most salutary mineral Principles, is far preferable to either.

In hypochondriacal Disorders, we have already recommended this Water as a Bath, in Conjunction with the internal Use; because, in this Disorder, the capital Organs being obstructed, it is necessary to soften the obstructing Matter gradually with this universal Menstruum or Solvent: It is on this Account, that the Water ought to be taken, for some Time, before the hypochondriac Patient ventures upon Bathing.

Tender debilitated Constitutions, that abound with a Cacochymy, or a Plenitude of ill Humours, require Evacuants; but, on account of their Weakness, the most gentle and easy
Remedies

Remedies must be used. I therefore can recommend nothing milder than this Sulphur-water, to edulcorate the acrimonious Humours; to soften and dissolve the slimy glutinous Matter; to scour, and cleanse the glandular Convolutions; to discharge the unhealthy Dregs, by the various Channels and Passages ordained by Nature as Outlets; and to restore the Functions of the Stomach, and other Viscera.

This Water is also an excellent Absorbent: Therefore where there is a great deal of four Slime lodged in the *Primæ Viæ*, it is an efficacious Remedy. In Obstructions of the Liver, and in the Jaundice, it proves a powerful Deobstruent. It removes schirrous Tumors, and gives great Relief in Cancers. Nor is it useless, sometimes, in the Gravel.

In the Dysentery it is an efficacious Remedy; as it corrects the sharp Humours, and carries them off with the least Irritation possible. In the Lientery, or *Fluxus Coliacus*, where the Victuals pass through the Intestines undigested, it is of great Utility: Because it strengthens the Stomach and Bowels, and opens the Mouths of the Lacteals. In an habitual Tenesmus this Water may be advantageously used; provided constant Clysters are made of it, that so the Water may be brought
into

into Contact immediately with the Part affected, without undergoing any Alteration in the Stomach and Bowels ; especially if at the same Time the Humours are corrected, and amended by its internal Use.

In a Vertigo, whether it be nervous, or takes its Rise from Obstructions, or where the Matter is extravasated, and can, by any possible Means, be disposed to be taken up into the Circulation, this Water is no despicable Assistant : But as the Matter that causes this painful Disorder is lodged in the most fine Threads, and delicate Membranes of the whole Machine, and lies, most frequently, deeply rooted ; the Water must be used long, and carefully, lest the peccant Matter be only agitated, or stirred up, and not discharged.

In the Catarrh, where the Humours are all on float, this Water, both internally and externally, is of singular Service : Because it attenuates, divides and evacuates ; and braces the relaxed Glands.

In all Contractions, or Weakness, of the Limbs ; where the nutritious Juices are wanting, and a Decay or Waste has taken Place ; these Waters, by external and internal Application, have proved themselves of great Efficacy.

In the Consumption, or *Febris Hectica*, they are at the Head of all Remedies that have ever been thought of, or advised for this Disorder; and will still further extend their Fame.

In the City of *Frankfort* in *Germany*, there is an excellent Sulphur-spring of this Kind; and there are many of the same in the *Circle* of the *Upper Rhine*, and Province of *Wetteravia*; all which serve as so many dernier Resorts to the Physicians of these Parts, for their Patients in these Disorders: Wherefore I cannot in these Cases sufficiently recommend this.

There is another Advantage accruing to the consumptive Patient at *Llandrindod*, viz. the Air; which, in Purity, and due Temperature, equals, if not exceeds, that in the South of *France*. For it is a mistaken Notion, to think that a dry and hot Air is required in this Disorder. This is another Extreme that the feeble Constitution cannot bear. For, by Heat, the little Nutriment that is left, would be exhaled, and dissipated: For which Reason a suitable Medium in the Atmosphere, inclining rather to Moisture, to check the inordinate Propensity to sweat, is preferable.

In an habitual Weakness of the Nerves; in nervous Convulsions; or hysteric Cholicks,
for

for want of a radical Cure, periodically returning ; in the Rheumatism, wandering or fixt in any Part of the Body ; this Water has greatly signalized itself.

In the Leprosy, Scurvy, Herpes, tetterous Eruptions, and old Wounds, this Water is beneficial : In which Case it is advisable to drink, bathe, and to dress the Wounds with its natural Balsam, the black Precipitate. In some of these Cases, particularly the Leprosy, the saline Pump-water may be advantageously joined to this Sulphur-water.

These Waters are also, by other Gentlemen, recommended in Female Disorders, and undoubtedly they have their Merit ; but as the Rock-water, which is at Hand, is far preferable, we are not under a Necessity of making use of a Remedy less efficacious. What regards those Disorders therefore we will pass over in Silence ; and proceed to our last Chapter ; in which we will give particular Directions for its Use in the several Disorders for which we have recommended it.

C H A P. III.

Contains Directions for Drinking, Bathing, and all other Medical Uses of the Llandrindod Sulphur-water.

THIS Water may be used variously, as in Drinking, Bathing, Fomenting: Some old Sores may also, with Advantage, be dressed with its Sediment. We shall therefore touch upon every particular Article; that my Readers may not indiscreetly run into some preposterous Method of using it; or enter upon the right with Doubt and Uncertainty: For tho' it is, in its own Nature, a salutary Remedy; yet, thro' unskilful Management, it may become dangerous. Since we judge this Water, in particular, the best and fittest for an artificial Bath; and indeed, for any such external Use designed for the Relief of chronic Disorders; and as it is a no less beneficial internal Medicine; we will therefore consider it with respect to Bathing; and then lay down such Directions as are required to regulate the drinking it: Both which, we apprehend, will be fully comprized under the following Heads.

I. How

1. How to make an artificial Bath. And how to guard against ill Consequences ; which sometimes ensue upon Bathing.

2. How to use a Bath made with this Water.

3. The Manner of Fomenting with this Water.

4. How to cleanse and wash old Sores with this Water : And how to dress them with the black slimy Precipitate.

5. In what Manner this Water may be drank, in Conjunction with Bathing.

6. How it must be taken, when Bathing is omitted.

In the Mineral Countries (as in *Germany* and elsewhere) where they have not the Blessing of the natural Sulphur-waters, they make, at their Smelting-houses, a Bath of the Slags, which is called the *Slag-Bath* ; and to this the chronic Patients repair in the most inveterate Cases. By this their Cure is forwarded, or facilitated, with the Assistance of other Medicines ; or at least they have the Comfort of receiving Relief, or having their Pains and Symptoms greatly mitigated. With how much more Reason then may we expect Success, from such a one as I am here speaking of ?

The

The Slags of which this Bath is made, are either of Lead, that will yield Silver; or of Copper. The Bath is prepared in this manner. The Slags are that Matter or Dross, which in the smelting Furnace like a Scum swims upon the smelted Metal. The Scum is, with strong Iron Ladles, carefully collected, and taken from the fluxing Metal; and thus red hot poured into cold Water. This is continued so long, till the Water becomes boiling hot: After which it is put into pitched Barrels, and so carried two or three Leagues distant, or to the Place assigned for Bathing; because, were they to use it too near the Smelting-work, the Smoke would infect the Patient. But, what is most remarkable, in all this long Carriage, the Heat does not near so soon go off, as when the Water is made boiling hot over a Fire; but will continue hot enough for bathing after it has been carried three Leagues at least from the Furnace, where it was prepared.

The Contents of this Bath are Sulphur and a vitrioline Acid; which insinuate themselves from these red hot Slags into any common Water they are put in: And that this is so, we are assured by Experiments. Now these Contents are naturally in this our Sulphur-water;

water ; but as they may be destroyed in making it into a Bath ; and as these Slag-Baths convince us, that the medical Virtues depend upon the sulphur and vitrioline Acid ; we shall therefore direct how to preserve these salutary Ingredients, and, if possible, farther improve them.

This we shall do, by shewing the several Methods of heating this Water to Advantage ; whether by *Slags* from a Smelting-house ready at Hand, to be made hot at Pleasure ; or with red hot Iron ; or with red hot Brick ; or with Spar ; or with the Steam of Mondic ; or with plain boiling Water ; just as the peculiar Case of the Patient may require : That we may convey to the most remote Parts of the human Body such Principles, as we know will correct the corrupt Juices. For our Machine is a porous spongy Body, and readily imbibes the Water ; along with which these Contents are conveyed, being intimately united therewith, and by that Union rendered infinitely subtile.

The Fluids are not the only Parts, that are affected with the Water in Bathing ; but the whole Frame is no less so : For, by the Laws of Circulation, the Principles of the Bath are carried to every Part of it ; as is evident from the ill Effects which irregular and improper Bathing

Bathing occasions ; against which we cannot give sufficient Caution. But this Point is extremely well treated of by Dr. *Oliver* of *Bath**. Let us therefore proceed according to the Articles we have confined ourselves to ; and give Directions ;

1. *How to make an artificial Bath : And how to guard against the ill Consequences, which sometimes ensue upon Bathing.*

Having observed the Possibility of having these warm Baths at *Llandrindod* ; and there being divers Ways of preparing them, according to the different Use and Purpose they are intended to fulfil ; I will describe the various Processes, and annex to each its particular Use.

The most common Way of making these Baths is, to heat some Part of the Water over the Fire in a Boiler ; and to add it to a Quantity of cold Water in the Bathing-tub ; by which Means a Degree of Heat is brought on requisite for Bathing. But in this Method it would be better not to make the same Water hot ; because its Texture becomes so much

* A practical Essay on the Use and Abuse of warm Bathing in gouty Cases,

changed in heating, that it immediately destroys the volatile Contents of the cold Sulphur-water. Wherefore it is more adviseable to boil common plain Water; and with this to give a sufficient Heat to the Sulphur-water, for the Purpose of Bathing.

From 60 to 70 Gallons of Water are sufficient for one Person. Put therefore that Quantity of the Sulphur-water into the Bathing-tub: Then make from 12 to 20 Gallons of common Water boiling hot: Of which pour into the Bathing-tub as much as will be requisite to bring the Sulphur-Water to that Degree of Heat, it is desired to be of.

In all this Operation a peculiar Dexterity is required. The cold Sulphur-water must not stand long in the Tub, because the volatile Spirits would exhale: For which Reason the Bather must not delay going into it, as soon as ever it is ready.

This is the most common Method of making Baths of cold mineral Waters. But there are others, which, we suppose, will increase the sulphureous Contents, and add to their Efficacy. Such is the Method by Slags. But there it will be necessary first to have Slags from a Smelting-house at Hand; then to make them red hot with Sea-coal in an Essay-furnace,
or

or Smith's Forge ; and whilst they are heating, to throw now and then a Handful of Sulphur upon them, amongst the Coals : By which Means the sulphureous Particles will be multiplied. When they are red hot, let them be put into the Sulphur-water, that is intended for the Bath ; which, being sufficiently warmed, may be used as is commonly directed in a Bagnio.

The same Method may be pursued with Spar, Iron, Brick, Mondic, Antimony, or any Mineral we have a Mind the Bathing-water should be impregnated with. These certainly communicate a Tincture to the Water, and with the Tincture their Principles. For Spar will emit a Kind of a Volatility of an absorbent Quality, somewhat inclining to the Spirit of Lime-water, but more mild and benign than that. Brick will render the Water somewhat alkaline. Mondic yields a vitriolic Acid ; and will hereby encrease the Sulphur. Iron and Antimony will give it their own peculiar Tincture ; as evidently appears from the Water in the Forges, in which the Smiths cool their Iron. Thus we may improve or change this Water at our own Pleasure ; and make it either relaxing or astringent : For Brick and Spar give it the first Quality ;

lity; and the other mentioned Ingredients render it to a certain Degree more or less astringent.

The Steam-baths are the Vapours of the Water that rise in a certain Degree of Boiling. To prepare these a Vessel or Boiler is required, whose Mouth or Opening must not be larger than will emit a sufficient Quantity of *Effluvia* to cover the Patient; who is to sit, just above, to receive them, on a Stool with Holes contrived for that Purpose. This Stool is placed exactly over the Boiler; which is bricked in a Furnace (as brewing Pans and other Things of this Kind commonly are) that the Fire, and Smoke may not incommode the Bather. The Water is brought to a simmering Condition; or to such a Degree of Boiling, as is commonly observed in the Process of Evaporation; being the highest Degree, and producing the greatest Abundance of Steams: As may be observed in the making of common Salt; where all Endeavours are made use of to encrease the Vapour; because, upon a quick Exhalation, the whole Success and Dispatch of the Operation depends.

In this Steam the Patient remains sitting, till a Sweat is promoted to a certain Degree,
or

or as long as is required for his Disorder. As for Instance, these Steam-baths are intended to relax a rigid and obstructed Fibre; to open the Pores of the cutaneous System; and to dissolve chalky terrestrious Matter, that is lodged in the Joints and other Parts: Now to what Degree this Disorder is fixed, and according to the Part affected, this Kind of Bathing must be directed and guided.

There is another Kind of Bathing, called the *Stillicidium*, or *Dropping Bath*; different from the Pump. For the *Stillicidium* or Dropping is gradually applied to the Head only; but the Pumping is not confined to any particular Part, but may be directed to any, that happens to be contracted or otherwise affected, in what Quantity, or what Degree of Force you please. This *Stillicidium* has been often of infinite Service in Deafness caused by Obstructions; has restored Speech lost by Palsies or Apoplexies; has cured the Ozæna, and the like Impediments in the Head: But it requires such a prudent Management, that one would rather first try every Thing else, than make Use of it: At least I do not chuse to recommend it, unless when all other known Remedies have failed; because the Consequences are dreadful, which an injudicious and care-

less Use of it may bring on. However, we will lay down the Method that is used.

On the Top of the Head, near the *Sutura coronalis*, the Hair is shaved the Breadth of four Fingers in Length, and as much in Breadth. The Eyes and the lower Part of the Head are secured with waxed Cloth, or the like; that the Moisture may not gradually soak thro', and incommode the Eyes. Upon this shaved Part, the warm Water is gradually dropp'd in the Morning, immediately after rising, and suffered to run all over the Body. When the Bathing is finished, the Body and Head are to be well dried immediately with clean Cloths, and cloathed as warm as possible; and the utmost Care taken to keep out the cold Air. How long to continue in this Kind of Bath, or how often it is to be repeated, cannot be determined, but must entirely be left to the Physician, that prescribes it, and is acquainted with the Constitution of his Patient. It is most commonly begun with a Quarter of an Hour; which is, each Time, encreased 10 or 15 Minutes, till it comes to two Hours. During most of the Time of using the *Stillicidium*, the Mouth fills with Spittle: So that, as it is a Kind of Salivation, it is commonly regulated accordingly;

dingly ; its Abatement being deemed the Criterion when to desist.

In desperate Cases this Way of Bathing is used sometimes twice a Day. Some bathe in the Afternoon, or toward the Evening only ; and drink the Water in the Morning : But for this no positive Direction can be laid down.

Having shewn the several Ways by which this Water may be prepared into Baths of various Uses and Qualities ; let us now proceed to guard against the ill Consequences, that may attend the Use of them. Here we would first inculcate that well known Caution, commonly laid down as a general Rule, *viz.* not to bathe too warm, nor too cold. The Extreme of either Kind is attended with great Danger, and therefore we cannot sufficiently warn our Reader against it. During the Use of the warm Bath the Stomach must be consulted ; for it commonly takes away the Appetite, and impairs the Office of that Organ, by driving the Heat and Juices into another Channel, *viz.* from the Center to the Circumference ; and renders the Body costive. If either of these Incidents supervene, betwixt Bathing longer Intervals must be ordered ; a proper Diet used ; together with the Help

of such Things as have a Tendency to invigorate the Stomach, and render the Body soluble.

Nor must the Flesh-brush, or Friction with Flannels, be omitted, before bathing, whilst in the Bath, and after bathing; particularly in such Places, where the Complaint has fixt its chief Seat; that the obstructing Matter, may by this Mean be attenuated and expelled; and the callified Vessels brought into a proper supple Tone again.

These are the principal Means required, in order to prevent the Danger of Bathing; which, if they are strictly observed, we need not fear any evil Consequents; altho' Bathing has this in common with all other powerful Remedies to do the greatest Harm, if improperly used.

2. How to use a Bath made with this Water.

The Use of a Bath made with this Water has no manner of Difference from other Baths, either natural or artificial; but may be practised after the ordinary manner. They may begin with 15 Minutes or half an Hour, till they arrive at two Hours, more or less, according to the Degree of Strength in the Patient.

The most proper Time for bathing is in the Morning; provided the Constitution is
able

able to bear it : If otherwise, it must be enter'd upon towards the Evening. In the Bath the Patient must avoid Sleep, as highly dangerous : Nor let him make use of Cordials of any Kind ; but, if needful, let him revive himself with some agreeable Odorific, such as volatile Salts, or the like ; but with nothing intoxicating.

After he has left the Bath, he must immediately repair to a warm Room ; and, after being well dried, go directly into a warm Bed, in order to encourage a natural Sweat : And if here Sleep overtake him, it may be indulged. But above all Things, lest the Pores of his Skin be shut too suddenly, he must that Day be cautious of exposing himself to the cold Air.

During the Period of Bathing the Diet must be simple, and cooling, without Spice, or such Things as will excite inflammatory Heat ; and, to temperate what naturally arises upon Bathing, at Night let a gentle Dose of cooling Physic be taken ; and if that avails not to subdue it, the Bathing must be omitted, and a Physician consulted on the Occasion ; that without Loss of Time the Complaint may be removed.

Bathing commonly causes Eruptions in the Skin; particularly in those Habits that are subject to the Scurvy, Leprosy, and such Disorders where the like Defœdations are Concomitants of the Disease. In this Case the Patient must remain longer in Bed after Bathing; and if he be thirsty, and require to drink in Bed, let him take some of this Sulphur-water, Milk or Blood-warm, and with this only let him quench his Thirst; so will the morbid Matter, that makes its Way thro' the perspiratory Pores, be sooner discharged.

In these Cases Bleeding, Cupping, and Purging may advantageously be used; provided they are properly adapted to the Disease and Temperament of the Patient. But these spontaneous Eruptions may, in a great Measure, be prevented, by purifying the Body and Mass of Blood with the saline Pump-water, and emetic antimonial Wine, taken as an Alterative: For it is confirmed, by a Series of Observations, that they who do not prepare themselves in this manner, break out in a most intolerable manner after four or five Days Bathing.

In Leprosies, where the Eruptions have happened plentifully, in an herpetical or tetters Appearance, long Bathing, repeated
three

three or four Times in a Day, has been found of great Efficacy : But in this Case great Caution must be observed, and the Patient must always repair to Bed as soon as he comes out of the Bath.

Sometimes it will happen (and particularly to those Patients that do not stay long enough at the Spaw) that the Breaking-out ensues, after they are come Home ; in which Case they must have Recourse to cathartic Medicines ; and to an emollient Bath first ; and afterwards to a discutient one : Perhaps that made of Sulphur, Antimony, crude Salt Ammoniac, Roots of Ellebor, and sharp-pointed Dock, may be as good as any for that Purpose.

I recommend to those that bathe in other Chronic and nephritic Cases, an exact Observation of the Rules laid down by the most learned Dr. *Oliver* of *Bath*, in his late Essay on the Use of warm Bathing in gouty Cases.

Dr. *Oliver* * also has, with great Propriety, demonstrated the Necessity of having the Head open to the free Air, in the Time of warm Bathing ; and, where it is necessary to

* A practical Essay on the Use and Abuse of warm Bathing in gouty Cases. By *William Oliver*, M. D.

do it, the Bather may sink over Head just before he rises out of the Water. He justly observes, that this Part of Bathing long puzzled the Bathers, and their Advisers. For my own Part, I confess * that I have been of the contrary Opinion in this Article of Consequence : But am not ashamed to retract my Error ; and to acknowledge, that, from the Doctor's just Way of Reasoning, I am now convinced that I was before mistaken ; and that the Method he insists on is the prudentest and most beneficial.

3. The Manner of Fomenting with this Water.

Under this Head comes the Vapour-bath ; which is when only the Limb or Limbs, that are contracted ; or any Tumor, or Part, where the Circulation is languid or lost, is put into the Steam of this Water : Or when the Exhalations are brought thro' a Tube to the Parts affected. Either of these, with great Propriety, may be termed a Vapour-Foment.

They may be said to use it by Way of Fomentation, who immerse one or more Mem-

* See our Treatise on the Origin, Nature, and Virtues of chalybeate Waters, and natural hot Baths, Page 62, 63.

bers, and not the whole Body, in this Bath. Hence the Pumping with Bath-waters answers the same End : And tho' this is not performed in the same manner as Fomenting commonly is done ; yet the Effects and Intentions are the same in both ; for which Reason we have ranked it under this Head. Many other Kinds of Fomentations may be contrived ; which particular Circumstances and Indigencies will indicate to every one.

4. *How to cleanse and wash old Sores and Tetters with this Water : And how to dress them with the black slimy Precipitate.*

The Sore ought first to be well cleansed before the black Slime, as a Consolidant, is applied to it. (For though it sometimes will act the Part of a Mundifier, as well as a Healer, at one and the same Time ; yet no Dependance is to be laid on it with that View.) The Wound therefore ought to be, for several Days, well washed with this Sulphur-water made warm ; during which Time, wet Cloths must be constantly applied and kept to it. When thus the Sore (whether it be Wound or Tetter) is cleansed, it may be dressed with the black slimy Precipitate, in the same Manner as other Wounds are dressed with Salve.

In

In these Cases dressing the Ulcer is the least Part: The Patient therefore must closely pursue the inward Course, and drink the Water plentifully. And if this does not bring on a gentle Purging, he must add as much of the Pump-water as will.

Or if the Sores or Tetters are scorbutic, he must drink the saline Pump-water only; and dress his Wounds with this Sulphur-water, and its black Precipitate.

5. *In what Manner this Water must be drank in Conjunction with Bathing.*

In a broken Constitution, brought on by hard Drinking, or in a rigid Fibre; or in other Cases, where both the internal and external Use are advisable, the Sulphur-water may be taken on the Bathing-days, as well as on the intervening ones. The Bathing may be used either two, three or four Times in a Week, just as the Constitution of the Patient, and the Disorder require it. What Water to drink with Bathing, must also be determined by the Disorder. In broken Constitutions, rigid Fibres, and such Disorders as come under this Class (but, in particular, where the internal Viscera, by hard Drinking, are become
hard

hard and callous) the Sulphur-water is the only one that can be recommended.

It must here be observed, that as Bathing frequently diminishes the natural Evacuations by Stools; so if it cannot be promoted by a suitable Diet, or with the saline Pump-water (where that may be used) then a Glyster, made with this and emetic Wine, must be injected in the Evening.

This has frequently been of very great Advantage in Gripes, Convulsions of the Bowels, Tenesmus, and the like Disorders, with which the mineral Water-Drinkers, sometimes, happen to be afflicted.

6. How it must be taken, when Bathing is omitted.

In what Disorders this Water is proper to be mixed, either with the saline Pump, or the chalybeate Rock-water, has been taken Notice of already. But there are Disorders where this is of great Service, if taken alone; particularly in the hypochondriac Malady, Consumption, and nervous Fevers, that border upon Hectics; in all arthritic Cases, particularly in such as exert their tragical Effects in the Stomach and Bowels; and in internal Ulcers, provided any Help can be given, and the Parts
are

are not too much corroded and destroyed. It may also be recommended as useful in a great Number of other Disorders ; but as they are recorded by Dr. *Short* *, we will forbear the Repetition of them. This I will venture to affirm, that in whatsoever Complaints, the *Thermæ*, or natural hot Baths are used with Success, this may be rendered equally advantageous.

Whoever will drink this Water medically should remember, that although it is of a gentle opening Nature, it is necessary here, as well as in the Use of other medical Waters, to prepare the Body by Purging, and sometimes Bleeding, provided the Constitution can bear it ; and if both are thought necessary, the Purge ought to succeed the Bleeding : And if the Pump or Saline-water is not strong enough, some artificial Cathartic must be contrived suitable to the Patient's Temperament.

When the Body is thus prepared ; let the Patient begin to drink the Water ; which, like all other mineral Waters, must be taken

* Dr. *Short*'s History on mineral Waters, Page 314.

in the Morning upon an empty Stomach: Or else between Breakfast and Dinner. Drinking in the Afternoon must be avoided; unless the Water be used at Meals, mixed with Brandy or Rum, instead of the common Drink; and about half a Pint, or somewhat more, be taken at Night going to Bed.

The Dose cannot be well ascertained: But it is best to begin first with a small one, from a Pint to a Quart in a Morning, taken at short Intervals in moderate Draughts, about half a Pint each Time; and so gradually increase the Quantity, as far as the Constitution can bear. If it sits easy upon the Stomach, and digests well, it is the true Standard, or *Quantum sufficit*, of the Sulphur-water: But if it gives the least Uneasiness, the Dose is too large; but then those stomatic Medicines may be joined, that are usually taken with the *Bath Waters*.

How long the Course must be continued we cannot strictly determine: But it never should be left off in less Time than four or five Weeks. In a Word, every one may proceed here, in the same Method, as is commonly observed with *Bath Waters*.

After the Course of Drinking these Waters is completed, the Patient must purge them off (for no one should travel with any Quantity of it left in the Body) and conclude in the same Manner, as is customary in Courses of other Mineral Waters.

The End of the THIRD BOOK.

P O S T.

P O S T S C R I P T.

Of the Benefit, that might be received by Persons afflicted with INTERMITTING FEVERS, from the Use of the saline Pump-Water of Llandrindod, or its Salts, when exported. Of the right Use of Purgatives, or other Evacuants, in the Cure of FEVERS.

WE have mentioned, in Book II. Page 196, the saline Pump-Water as beneficial in Fevers, and have recommended it as such: In which we do not proceed on mere Conjecture; but have, before us, the Example of two Gentlemen of the first Distinction in the Faculty, *Hoffman* and *Stahl*. The former had no sooner discovered the *Sedlitz* Saline Water, but he instructed a Chemist to extract its Salts for Exportation. I endeavoured to do the same by the *Llandrindod*-Waters; while I was at the Place: But could not meet with a Chemist to my Mind. Nevertheless I am still not without Hopes that,

in Procefs of Time, ſome proper Perſon will be found for this Purpoſe; that we may be ſupplied with the *Llandrindod* Salts at *London*.

About the Time when *Hoffman* diſcovered the ſaline Spring at *Sedlitz*, *Stabl* wrote a Treatiſe on the Practice of Phyſic; in which, under the Article *De Plethora*, he diſcourſes thus. “ The new Method of Purging is a
 “ very good one; that is, by drinking the
 “ *Engliſh* bitter Salts of *Epfom*. But the Salts
 “ from the new-diſcovered Spring at *Sedlitz*
 “ are much ſuperior to theſe; and the Water
 “ itſelf far preferable to the Salts. Of the
 “ *Epfom*-Salts from an Ounce to an Ounce
 “ and half, diſſolved in Water, is taken at
 “ once: But of the *Sedlitz*-Salts half the
 “ Quantity is ſufficient. Theſe ſaline Purga-
 “ tives work with all imaginable Eaſe; and
 “ require not the Addition of digeſtive Me-
 “ dicines: And where other purging Phyſic,
 “ by Virtue of its reſinous Acrimony, cauſes
 “ Heat, there theſe are Refrigerant *.”

It is therefore confirmed by the Obſervations of the beſt and moſt eminent Practiti-
 oners in Medicine, that gentle and eaſy purg-
 ing Phyſic in intermitting Fevers is highly fa-

* *Praxis Stabliana*, Page 254.

lutory. The stronger Cathartics indeed we should take great Heed not to meddle with, on any Account, in these Disorders: But as there cannot be a more safe and easy Medicine than this Kind of Salts, they have been very happily introduced and recommended. Let us hear what *Stabl* says on this Occasion.

“ * *Hoffman* has proved, in his Disputation,
 “ *de Fontis Sedlicensis examine Chymico-medico*,
 “ that the *Sedlitz-Salt* is far preferable to that
 “ of *Epsom* in *England*. And §. 22. on the
 “ Cure of *intermitting Fevers*, he says; that
 “ the *Materia Febrilis*, or the *Fomes & mi-*
 “ *nutiæ* of *intermitting Fevers*, are contained
 “ in the *Primæ Viæ*; and are particularly
 “ concealed in the *Duodenum*, and may be
 “ removed with the absterfive Salts alone, or
 “ with gentle Emetics added to them; but
 “ are more certainly and effectually carried off
 “ by the Use of the middling Salts, or those
 “ *Mediæ Naturæ*, provided they are taken
 “ for some Time. Whoever is acquainted
 “ with Cases of this Nature, will easily con-
 “ ceive, that the *Sedlitz-Water*, or its Salt,
 “ used in these Fevers, *diebus intercalaribus*,
 “ can hardly be equalled by any other Re-

* *Praxis Stabliana.*

“ medy. I am confirm’d in this Opinion by
“ Experience ; as I have used these Salts in
“ frequent Cafes of this Kind, and never yet
“ found them to fail in one.”

As *Hoffman* has proved by Experiments the *Sedlitz* Salts to be preferable in Goodness to those of *Epsom* ; I have tried the Salts of the *Llandrindod*-Waters in every Shape and Method, and will venture to affirm they excel those of *Sedlitz*. For a Proof of which I refer the Reader to the Experiments set forth in Book II.

We have declared that the saline Water itself is, in Fevers as well as other Disorders, more efficacious than its Salts. To which it may perhaps be objected, that large Quantities of cold Liquors are highly detrimental, on account of the glutinous fizy Matter, which in a Fever lines the Stomach and Intestines. That the immoderate Use of cold Liquor, especially in the Paroxysms, must constrict this glutinous Matter, and make it adhere still closer to the Guts and Stomach ; of which dropfical Swellings are frequently the Consequents. But nothing of this is to be feared from the saline Pump-water of *Llandrindod* ; because, tho’ cold, it resolves and
attenuates

attenuates the thick fizy Matter, and strengthens the Fibres of the Stomach and Intestines; and even in the Paroxysms does less Harm, taken quite cold, than other Liquors not sufficiently warmed. I cannot therefore but wish the *Llandrindod* Waters were, for this Purpose, introduced and prescribed at *London*. For though it would be more eligible to drink this, as well as other mineral Waters, at the Spring-head (as we have before directed) where it is, no doubt, most efficacious; yet I am persuaded it would answer many good Purposes when exported; and those Patients, whose Business or other Circumstances would not permit their Attendance on the Spot, would not fail to receive considerable Benefit, and find their Account, in drinking it at Home. The Water indeed, where it can be had, is always to be taken in Preference to the Salts. For though we may safely enough pronounce the *Llandrindod* Salt to be equal at least, if not superior, to those of *Sedlitz*, or any other in Use; yet all these chemical Salts, if taken for too long a Time, or in too large Quantities, are apt, more or less, to shave the fine Coats of the Vessels, and thereby somewhat impair the Constitution; as we have before observed. We therefore only

recommend the Salt as a Succedaneum or Substitute to the Water, where the latter cannot be conveniently procured : And as such, I am persuaded, it would, with proper Management, prove a very serviceable Remedy.

Great Care will be likewise necessary, that the Water, when exported, be stoppt close, and well secured ; otherwise it will lose much of its Efficacy ; and if kept in a close Place where the Air is stagnated, become fetid. And tho' by opening and exposing it to the clear Air, it may be rectified, and recover its primitive Purity ; so as to become again very fit for the Purposes of a Purgative ; yet will it have suffered a considerable Diminution in its good Qualities as an Alterative ; for which, after such an Accident, we would hardly venture to recommend it.

I would not here be understood as if I intended to recommend these Waters or their Salts to be used, as Evacuants, immediately on the Commencement of Fevers. No ; I am too well aware of the bad Consequences that might attend such a precipitant injudicious Proceeding. I am very sensible, that if the peccant Matter in an intermitting Fever be attacked too soon, either by Vomits or brisk Purges ; a Dropsy or a Consumption may probably ensue.

sue. The Matter ought therefore to be first prepared by Digestives; after which (if we would proceed regularly) we must have Recourse to Evacuations.

Stabl's Observations relating to the Method of curing intermitting Fevers very well deserve our Attention. He says, the Cure depends on these Particulars. 1. That the Matter be corrected. 2. The Motus by no Means check'd or prevented; but on the contrary supported and encouraged. 3. Not to stop the Excretions all at once. 4. To recover the Parts to their pristin Tone. And 5. to preserve an Equality of Transpiration.

The same Author acquaints us, as the Result of long Experience, that in the Preparation of the peccant Matter, the Vegetable Digestives have proved themselves to be slow and nauseous; and that they irritate the Blood and encrease the Heat. He therefore particularly recommends, for this Purpose, the bitter Salts *. In Imitation of whom, we may venture to advance; that the *Materia Febrilis* may be fitly prepared and disposed for a Discharge, by the Use of this *Llandrindod-Water* or its Salts, in an alterative Way.

* *Praxis Stabliana.*

In the alterative Use of this Water, the necessary Evacuations, such as Purging or Vomiting, are not to be omitted. But here the Caution is needful, that they be given in a proper Time; otherwise they will (Vomits in particular) do more Harm than Good. Many Physicians prescribe Vomits in intermitting Fevers, either just before, or in the Paroxysms; in which they think they act conformably to Nature. But they do not consider that Nature, at this Juncture, labours too much already; and by this additional Burthen becomes still more irritated; and may possibly fall into a Habit of Vomiting. It is therefore more agreeable to Nature, to administer Emetics at such a Time, when she is quite free from all Shocks, Labours, or preternatural Motions excited by the Fever. The same Rule is to be observed in administering Purgatives to Patients labouring under this Disorder.

When a Vomit is necessary in the Course of Drinking this Water; it may be adviseable to take *Vin. Benedict.* or an Infusion of *Ipecacuanha* in Wine, and work it off in the usual Manner. But for a purgative Intent, it is proper to use the Waters or Salts themselves.

A P P E N D I X,

Containing a short and summary Account of several other Springs of mineral Waters in Wales. To which are added some Considerations on the Utility of chemical Knowledge in the Practice of Physic; and several Arguments offered in Defence of the Author's Assertion, That heavy Medicines do not operate in the human Body by their natural Weight or specific Gravity.

OF all the Nations in *Europe*, none have been more diligent and careful than the *Switzers*, in examining the Nature and Properties of the several Waters, that issue, in great Plenty, and ouze out of the Hills, Rocks, and Mountains of their Country. This laborious indefatigable People seem to have entertained a just Sense of these incessant Floods of Bounty, with which kind Providence has bless'd their Land; and have therefore employ'd all their Study, and exerted their utmost Efforts to make the best Advantages of Nature's

Nature's Favours, by rendring the genuine Productions of their Country subservient to the Health and Interest of the Inhabitants. Dr. *Scheuchzer* has given us a copious Description of the Nature and Qualities of the *Swiss* Waters, grounded on Facts, and drawn from Experiments, in two large Volumes in Quarto; in which he has been so accurate and particular, that hardly one Spring has escaped his Notice.

If a Man were inclinable to draw Parallels between distant Countries, or the various Parts of this our Earth, I know of no two that bear a more striking Likeness to each other than *Switzerland* and *Wales*. The external Superficies of both Countries are rugged, stony, and cragged; loaded with rocky Hills, and Mountains of vast Extent and Altitude. These *Welch* Mountains (as it were in Allusion to the *Swiss*) are termed the *British Alps*: And exhibit a further Resemblance of the *Alps* in *Switzerland*, in that they are cloathed with similar Kinds of Herbage; produce Plants and Vegetables of the same Nature; and nurture and raise them to a like Degree of Virtue and Perfection. As therefore these Circumstances could hardly exist, without a remarkable Similitude between the Soil, Air, and Atmosphere

phere of the two Countries; may we not by a Parity of Reason conclude, that their Springs and Fountains of Water have some Degree of Affinity one to another? Nature seems to have indicated, by the near Resemblance of the outward Aspects of these two Countries, in all their various Wildness of Dress, and Asperity of Surface, that there is a proportional Agreement in their internal Parts; that their Wombs are pregnant with the like hidden Treasures; and that the same rich Juices and salutary Fluids are copiously circulated through the Veins of both. Hence it will be no wonder; if, in Process of Time, Springs of several Kinds of Water shall emerge into Use and Repute in *Wales*, of the like Nature, and endowed with the same Qualities, with those already known and celebrated in *Switzerland*.

There are, to my Knowledge, several mineral Waters in *Anglesea*. With one of them, in particular, I am well acquainted: I mean that on *Troesellyne Hill*, sometimes called *Paris Mountain*, in the Estate of Sir *Nicholas Bayly*, Bart. Knight of the Shire for *Anglesea*. From some Experiments made on this Water, I look upon it to be one of the true *Acidulæ*
of

of the Ancients. It turns Syrup of Violets red ; and has not the least Sign of any chalybeate Contents. For it is no better than a vulgar Error, to give to Waters impregnated with these Contents the Epithet *Acidulæ*.

Another Spring of mineral Water is in the Bishop of *Bangor's* Garden in *Carnarvonshire*, in the Town of *Bangor*, just by his Lordship's Palace. And there is likewise another, of the same Kind, about half a Mile to the East of *Bangor*, at *Aber Keggen*, in general *Warburton's* Estate. Both these Springs are chalybeate, of the most common Kind, and somewhat rough in their Nature. This Asperity is the Effect of Coal ; from which these Springs immediately proceed : For Coal is plentifully dispersed through this mineral Zone ; and is indeed the chief predominant Fossil throughout the whole Neighbourhood of *Bangor*. And we may venture to lay this down as a certain Maxim ; That wherever the Bowels of the Earth abound with Plenty of Coal, there chalybeates, of this Sort, are never wanting.

This same County of *Carnarvon* affords also another Water ; which is commonly reputed to have in it some few medical Contents, to a moderate Degree of Efficacy. It is at *Trefriw*, within two Miles of *Llanwrst*, or (as
it

It is vulgarly call'd) *Llanroft*. I made several Experiments on this Water, in order, if possible, to find out its true Contents : But could discover nothing more than a small faint Sign of common Salt ; because, with a Solution of Silver, it became, in a small Degree, milky ; and caused some little Precipitate. Was this Spring regularly traced in its Channel, there is a great Probability that another of the same Kind might be discovered, but stronger and more saline, as replenished with a larger Quantity of Contents.

But in much higher Repute is another Spring, within a Mile of *Llanwrst*, in *Denbighshire*, in the Estate of *Thomas Kyffien*, of *Mayne*, Esq; This Water is frequently used with good Effect, as a cold Bath, by the common Sort of People ; who have been relieved by it of several Complaints. Sometimes they plunge into it, and immerge their whole Body ; at other Times they only wash or dip the Parts affected in the Water : And both these Methods have often proved beneficial. This is the only Use that has hitherto been made of this Spring ; for I never yet knew of any, who have taken it internally. It is of a wonderful Softness ; and impregnated with ætherial Spirits. I made a few Experiments on this Water ;

ter; which I shall just mention, in a cursory Manner, for the Satisfaction of those of my Readers, who are acquainted with the Spring.

1. With Spirit of *Sal Volatile* it turns Milk-white. 2. With Oil of Tartar *per deliquium*, of a Pearl-colour. 3. This Whiteness increases by an Effervescence caused by the vi-
trioline Acids. 4. With *Sal Absinthii*, it turns milky. 5. With Tincture of Cochineal, of a fine Orange Yellow: And 6. the same with Spirit of Lavender.

This Water at present is too much diluted, or rather deluged, by being plentifully mixt with Water from other Springs, that are void of all medical Contents: Which must naturally render it poor and inefficacious. But there is good Reason to believe; that were these other spurious intruding Springs drained or averted from it, and the genuine Water convey'd pure and unadulterated, through its own proper Channel, into a bathing Reservoir, it would make an excellent Bath for many good Purposes. The Reason for this Suggestion is obvious enough. For as the Water of this Spring is, in its Nature, light and subtile, and soft to that Degree, that we
might

might almost term it unctious; hence the Pressure is evidently lessened, and the Water can insinuate itself thro' the Pores of the Skin with greater Facility.

In this same County, there is also another medicinal Spring, near *Ruthyn*; which, I am credibly informed, was in great Repute some 25 or 30 Years ago; and was prescribed in several Disorders, not without good Success, by Dr. *Foulks*, an eminent Physician, who resided about that Time at *Ruthin*. This Spring is about a Quarter of a Mile South of the Town, and is known by the Name of *St. Peter's Well*.

The Well is in the high Road, surrounded by the Lands of *Richard Middleton*, Esq; of *Chirk-Castle*, Member of Parliament. It is walled in; and there is a Bason erected, into which the Water springs forth. But at present, as the Use of it is quite discontinued, the Bason is much out of Repair; and other adventitious Water, devoid of all medical Contents, runs in and commixes with it: So that I found it utterly impracticable to make any Experiments on it that were solid and conclusive. However, while I was at this Well, I found, upon Trial, some Alteration made with *Spir. Sal. Volat.* and *Ol. Tartar per Deliquium*;

liquium ; for it turned, with these, to a Pearl Colour ; and did the same with *Sal Absinthii* ; which afterwards changed into an Oaker-yellow Sediment. With Galls there appeared not the least Alteration : Though I was assured, it would strike a purple Colour with Galls, before the wild extraneous Water had mixed itself with it.

Ruthin is a fine genteel Town, pleasantly situated at the South End of the Vale of *Clewjdd* ; blest'd with an healthy temperate Air, and favour'd with a very delightful Prospect. In this Town, and its pleasant Neighbourhood, live a great Number of Families of Distinction ; who, meeting in a publick Room in the Town, adapted to that Purpose, compose a very brilliant and polite Assembly.

These are the principal Springs and Wells as yet discovered in *Wales* ; and there is no Doubt but some of them might, with requisite Improvements, and proper Management, be render'd serviceable to the Inhabitants and others by their medical Virtues. But as yet they must all submit, and veil their Glories to the more shining Perfections of the Waters of *Llandrindod*, whose superior Merit they cannot (at least as far as we yet know) pretend to approach in any considerable Degree of Vicinity ;

cinity ; much less to stand in Competition with them for Character, or to rival them in Dignity. The Reputation of the *Llandrindod* Waters is daily increasing ; and as it is built on so firm and solid a Basis, founded on real Facts, and supported by faithful Experiments, it seems to promise a long Continuance. They have proved their Right to Honour, from the noblest and most indisputable Title, that of *doing Good* : And as they have been, and continue still to be, the happy Means of preserving Life, recovering Health, and restoring Strength and Vigour to many of their Visitors, they have a just Claim to our good Esteem, and sufficiently merit our best Commendation.

But tho' the Waters of *Llandrindod* have deservedly obtained a great Share of Fame, by the Cures they have already performed ; their Reputation is yet but rising : Nor has their Utility been so extensively experienced hitherto, as we hope it will hereafter, for want of proper Directions in their Use, and a rational Account of their natural Qualities and medicinal Virtues. To supply which Deficiency, is the Intent of the foregoing Sheets. And here I believe it will be granted, that no Art or Science can make juster Pretensions

to, or bid fairer for, an Ability of discovering the latent Virtues, and pointing out the several Uses of such Waters, than Chemistry; which, by analyzing their Contents, and examining their several component Principles, must necessarily give very useful Hints to a skilful Practitioner, and direct him how to apply them to the most beneficial Purposes. The popular Objection against the Certainty of chemical Experiments; “That all medicinal Compositions, either of Art or Nature, act in the human Body in a Manner very different from their visible Operation in the Hands of the Chemist,” is, I grant, not without Foundation. But then it bears equally hard on all other Arts and Sciences, whose Principles are usually called in to the Assistance of Physic; whether they relate to anatomical Enquiries, natural Philosophy, geometrical Proportions, mechanic Powers, or any other artificial Props or Supporters of doctrinal Tenets, embraced and commended by the systematical Physician. Not any of these, when chosen as Guides in the Study or Practice of Physic, can promise their Devotees infallible Direction. For be the Facts, and Experiments founded on them, ever so certain and undeniable; be the Observations on them
ever

ever so accurately and exactly made ; the Physician may, nevertheless, be deceived in ascribing to them the same *Modus operandi*, and expecting from them the same Effects and Consequences, when they are applied to living Subjects, as they before exhibited on dead Matter : Or else he may wander from Truth, and be misled in his Inferences and Deductions ; as nothing is more common than for Men, deeply engaged in speculative Disquisitions, to draw from true Premises false or uncertain Conclusions. So that this Objection is not so well calculated to depreciate the Excellence or Merit of Chemistry, in Comparison with other Arts and Sciences ; as to shew the Insufficiency and Uncertainty of Science in general, and the Weakness and Fallibility of human Reason ; which no one is more ready or willing than myself to confess. Every System, every Hypothesis, form'd by Man, is liable to Error ; for this plain obvious Reason ; that Man is, by Nature, a weak erroneous Creature, capable of deceiving and of being deceived. Hence it is, that the wisest of the Species, are the farthest from pretending to Certainty in their Speculations, or from ascribing Infallibility to human Reason. The utmost we can justly pretend to, in our strictest

and most curious Researches into the wonderful and amazing Operations of the Divine Wisdom, and the stupendous Works of the Creation, is Verisimilitude and Probability: Which, if we modestly pursue them, will be sufficient to teach us to avoid the dark uncomfortable Paths of gross Ignorance, and to shun the no less dangerous Rocks of Rashness and Arrogance; to keep as close to Facts as we possibly can; and not to build up too lofty Structures on the uncertain Basis of Hypothesis and Speculation. On these last, Chemistry is as little dependant, as any other Science whatever. It sets out on certain Facts, and proceeds on visible Experiments. And though it may err in some of its Applications or Deductions, the chemical Practitioner has, at least, an equal Title to Credit and Confidence with any other systematical Physician; and, in many Circumstances (supposing them both equal in natural Abilities) the former has the Superiority.

All Artists have generally a natural Propensity to be lavish in their Encomiums, each of that particular Art he professes: And this Partiality commonly excites Envy, in those of another Turn of Thinking; who, instead of looking on it as a human Infirmary, a Frailty incident

incident to Men of every Profession and Calling, do too often not only treat the Artist with Contempt and Obloquy ; but, what is still more unjust, fall foul on the Art itself ; and decry and vilify what they are not well acquainted with, only because other Persons have been too profuse in its Commendation. From this general Censure I would not be thought to exempt the Professors of Chemistry, any more than those of any other Science. We have our Bigots, as well as other Professions. The partial Chemist, he that has but some little Smattering in the Art, or has confined his Study to any single Branch of it, may, I confess, from Prejudice, or a Narrowness of Thought, be too apt to look on the human Body only as an Alembic, or some other particular Machine or Utenfil of the Laboratory. But the true Chemist will view it in a much more noble and extensive Light ; and admire it as a far more excellently contrived Machine ; which, within itself, for its own Conservation, performs innumerable Operations, all the Chemist can possibly think on, and many more utterly beyond his minutest Conceptions. In those which he can observe, he will discover such wonderful Constancy and Regularity, so much Art and Exactness ; that he will be in-

clined to affirm with *Stahl*, *Newman*, and other first-rate Chemists, That no Surgeon or Physician can rationally practise, till he has made a tolerable Progress in chemical Knowledge: Because, at all Times, the Application of fit and proper Medicaments with the right Use of the six *Non-naturals*, are very important Requisites, and capital Circumstances in the Art of Healing.

Let us but duely consider the Frame and Texture of the human Body, its constituent Members and component Parts, with their several Offices, Functions and Operations; and we shall soon find that *Physiology* (which comprehends *Anatomy*) is founded on Chemistry. How are we to conceive of the Commixtion of Substances; the solid and fluid Parts; the Digestion of the Food; the Processes of Chymification, and Sanguification; the Change of Lymph into Blood, and again of Blood into Serum and Lymph; I say, by what Light can we view all these more rationally, than by the *Syncripsis* and *Diacripsis* of the Chemists?

In *Pathology*, we can arrive at but a very inconsiderable Degree of Judgment without proceeding upon chemical Principles. For, to go no further than the *vitia primarum viarum*,

rum, which are occasioned by a Diminution or Debilitation of the digestive Faculty; that Physician is like to do but little Service in the *Therapeutic* Part of his Profession, who has no true Knowledge of Fermentation. Here Chemistry should be called in, to explain that great Variety of the Humours, together with their several Alterations and Corruptions (for all the Humours of our Body are liable to Corruption) from whence proceed Exulcerations, Putrefactions, Sphacelisms, and other morbid and distemper'd Ferments. Of how great Utility, in these Cases, is a considerable Share of chemical Knowledge, I leave to every discerning and impartial Man to reflect.

Nor is a thorough Knowledge of the Nature and Qualities of Medicaments, or a deep Insight into the whole *Materia Medica*, less requisite in the *Therapeutic* Part of physical Science. This Way of Reasoning, in other Arts, is always held as sound and coercive. Who ever heard of a good Mechanic, that was unacquainted with the right Use of his Tools; and the proper Application of the several Materials he is to make use of? How then can a Physician proceed more rationally in the Treatment of Diseases, without being acquainted with the Qualities of the several
Reme-

Remedies he prescribes, their natural Properties, and component Principles? And to what other Art, but Chemistry, does this useful and extensive Knowledge properly appertain?

I have been the more explicit in giving the Reader my Sentiments both of the Utility, and the Deficiency of the chemical Art; and likewise in making free and ingenuous Concessions of the Weakness and Fallibility of human Reason; that I might not be censured as arrogant or dogmatical for any Point of Doctrine I have advanced in the foregoing Work: In which, among other Things, I have asserted, that heavy Medicines (Mercury itself not excepted) do not operate in the human Body by their natural Weight or specific Gravity. As I have often advanced this in Conversation with a very learned and ingenious Gentleman of the Faculty; I have been lately honoured with a Letter from him, containing his Opinion of the *Modus operandi* of Chalybeates in general; in which he shews his Disapprobation of my above-mentioned Assertion. This Gentleman, who is my Friend, is endowed with many excellent Qualities. Few are better acquainted with the *Materia Medica*; which he manages with great Judgment, to
the

the Advantage of his Patients ; so that I always admire his Prescriptions. But as I differ from him in some theoretical Points ; particularly in that relating to the specific Gravity of medicinal Substances ; I shall (without entering into a formal Confutation of any thing advanced in my Friend's Letter, which is too long to be inserted here) only offer my Reasons for my own Opinion ; and then submit it to the Judgment of the candid and impartial Reader.

I. To avoid any Misunderstanding of Terms (which is generally the Cause of most Disputes) I shall first explain my Ideas of that *specific Gravity*, by which I deny that Medicines act in the human Body. By *specific Gravity*, I here mean that natural Ponderosity or Heaviness, that presses any particular Body or Substance, together with whatever Matter happens to come in its Way, downwards, or towards the Center. Now if we carefully regard the Operations of Mercury, Iron, or any other heavy Medicine, they will appear to us not to act in that Manner. Mercury, in particular, will in its own proper Nature never work downwards ; unless some saline Additamenta are joined with it, so as to irritate the lacteal Ducts ; as is evident in a Salivation ;

vation ; where it rises upwards in a Distill-like Manner, much in Favour of the chemical System.

2. It is frequently alledged in Defence of the opposite Hypothesis, that the ponderous Contents of heavy Medicines, such as the mineral Waters or mercurial Compositions, press by their Weight, and extend the Vessels : But this may be effected much better by spirituous light Matter, than by ponderous Contents. For Instance, in Drunkenness it is the Spirit of the Liquor that inflames the Blood, and extends its Channels ; and by no Means its solid Contents. Add to this, that it is hardly possible, that the circulatory Ducts can take up so large a Quantity of the heavy Contents, as will act by Pressure on the Blood-vessels : For it would greatly impede the Circulation, if there were such large Portions of the solid Contents of any heavy Medicine, either Martial or Mercurial, contained in the Blood-vessels, as to be capable of affecting them by Pressure.

3. The manner in which our daily Food operates, if duly attended to, seems to prove the Contrary of such a Supposition. For all our Aliment is ordinarily concocted in the Stomach ; and thereby becomes fitly prepared for
the

the several Juices : But any extraordinary Relicks, or such Part of it, as is too heavy either to be properly incorporated with the nutritious Juices, or to be regularly discharged by the Excrements, will remain uneasy in the Stomach, and cause disagreeable and unnatural Sensations ; till the Patient be relieved by a Vomit, or some other proper Assistance.

4. It has been often asserted, in Favour of the contrary Hypothesis, that common Water purges by virtue of its specific Gravity : But upon what Proofs this Assertion is founded, I am at a Loss to conceive. I rather think the contrary Opinion carries with it a much greater Degree of Probability ; and therefore must remain on the negative Side, till I see the Affirmative supported by some more convincing Arguments. At present I shall only appeal to the Water-drinkers themselves, Whether or no they are not always remarkably costive (let them swallow it in ever such large Quantities) and frequently obliged to take some proper opening Relievers, in order to procure them the Benefit of Nature ?

5. The best and most accurate anatomical Observations seem to contribute greatly to the Confirmation of what I have advanced concerning Mercury in particular ; that it does
not

not operate in the human Body by its Ponderosity or specific Gravity. For in Dissections of Subjects, who, when living, have dealt pretty largely in mercurial Medicines, we discover such phænomena, as seem plainly to indicate, that the Mercury has work'd thro' all the Vessels, and continually advanced to the Circumference, and not tended to the Center, or downwards: For we find it has left behind it little Holes in the Vessels, or Outlets through which it has pass'd in its Operation. Now in Proportion as the Mercury has been prepared in grosser or finer Particles, the Holes are accordingly bigger or smaller; and the Constitution is more or less injured and enfeebled. Hence it is that the Chemists, not without Reason, deem these coarse or rough Preparations of Mercury, corroding and acrimonious.

6. That live Mercury, or Quicksilver, is not so destructive to the Vessels, as that which has been prepared with Salts, seems easy to be proved from the Processes and Consequents of mercurial Unctions: And the same Observation is further confirmed by Dr. *Dover's* Method of taking Quicksilver; in which there are not such notorious Signs of that great Injury done to the Vessels by the free Use of the
common

common mercurial Preparations. And this Method of Dr. *Dover* seems also greatly to corroborate, what we are endeavouring to prove; *viz.* That heavy Medicines do not act in the human Body by their specific Gravity: For the crude Mercury, or Quicksilver, when made Use of according to the Doctor's Direction, tends not downwards or towards the Center; but appears to be raised and determined towards the Circumference by the animal Heat of the Body.

These are the Arguments I thought sufficient to offer in Defence of the Doctrine I have advanced. I shall therefore enlarge no more on this controverted Point, but submit it to the Determination of the candid and judicious. But before I take Leave of my Reader, I must desire him to take Notice, that my Commendation of the *Llandrindod* Waters, is not founded on this or any other speculative Hypothesis. Their Virtues are the same, let which ever Side of the controverted Question prevail. Their good Fame, I am persuaded, will extend in Proportion to the Increase of their Use; as it is established on Facts, and not on Fancy; on real Merit, and not on Conjecture or Partiality. What I have endeavoured in the foregoing Sheets, is only
to

to illustrate their good Qualities, and make them more conspicuous ; to direct their due Management ; to caution against any ill Consequents that might ensue an indiscreet Use of them ; and, by pointing out their beneficent Properties and salutary Contents, to invite the Afflicted to seek their Assistance.

F I N I S.
